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ABSTRACT

At the seventh Western Regional Conference on Testing Problems, the following speeches were given: (1) "A Guidance Person's Approach to Testing for the Discovery and Development of Human Talent" by Frances D. McGill; (2) "The Instructional Uses of Measurement in the Discovery and Development of Human Talent" by Roy P. Wahle; (3) "New Frontiers of Testing in the Discovery and Development of Human Talent" by J. P. Guilford; (4) "Identification of Academically Talented Pupils in the Discovery and Development of Human Talent" by John Gowan; and (5) "Tests Used to Improve the Quality of Instruction in the Development of Human Talent" by John E. Dobbin. A list of conference participants concludes the report. (KM)

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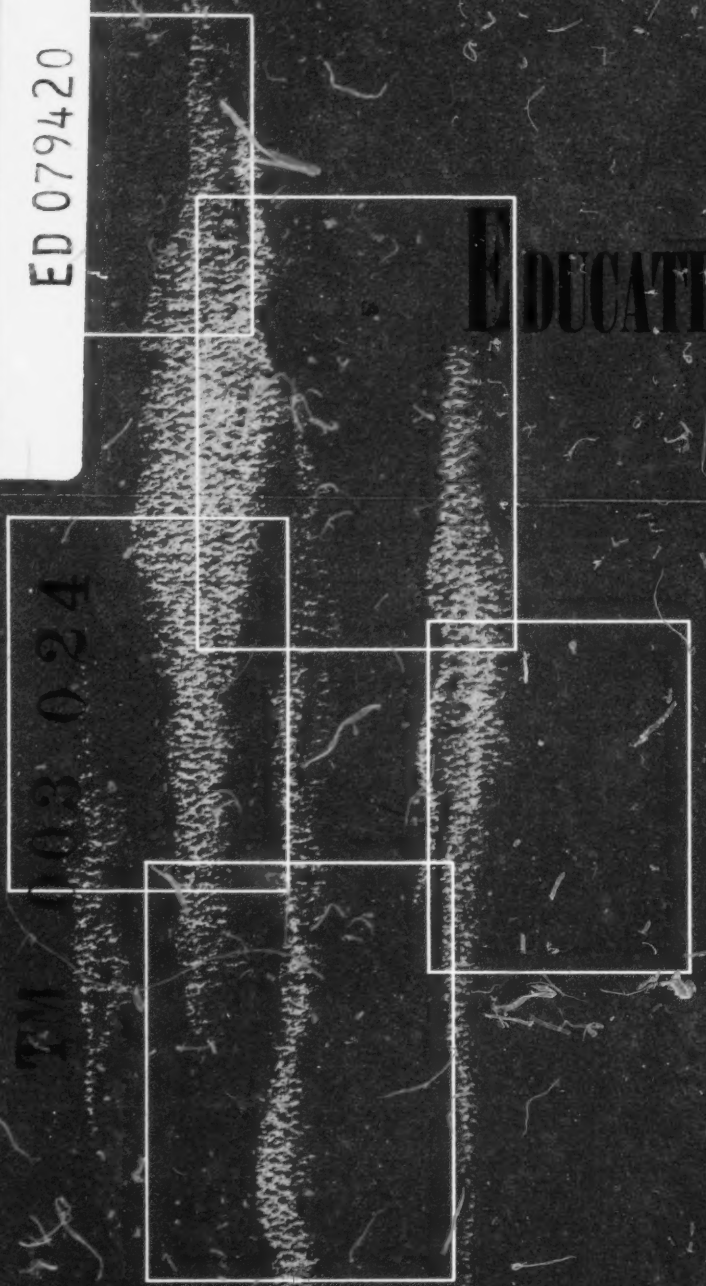

Seventh Annual
Western Regional Conference
on Testing Problems
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The Seventh Annual

WESTERN REGIONAL CONFERENCE ON TESTING PROBLEMS

Testing for the Discovery and Development of Human Talent

March 14, 1958

Hollywood Roosevelt Hotel

Los Angeles, California

Dr. William B. Michael, Chairman

EDUCATIONAL TESTING SERVICE

Princeton, New Jersey Los Angeles, California

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The Seventh Annual

WESTERN REGIONAL CONFERENCE ON TESTING PROBLEMS

The morning meeting of the Seventh Annual Western Regional Conference on Testing Problems, held in the Blossom Room, Hollywood Roosevelt Hotel, Los Angeles, California, convened at 9:30 a.m., Dr. William B. Michael, General Chairman, presiding. Dr. John S. Helmick, Director of the Los Angeles Office of Educational Testing Service, welcomed the conferees.

DR. JOHN HELMICK: I very sincerely wish to welcome you to another Western Regional Conference on Testing Problems. We are delighted that so many of you have been able to come today. The increase in growth of this affair is, I suppose, the best indication that it is serving some function of value and interest to the people in this area. We hope that we can continue to provide these conferences and that you will return again.

I also want to give credit where credit is due. A number of you have seen my name on documents concerning the Conference. Some of you - especially those of you who know me - are probably suspicious. I really haven't had much to do with what is going on. It is a delightful situation to get the credit without doing much of the work; but I want to pass the credit on where it really belongs, to the entire staff of the Los Angeles Office of the Educational Testing Service.

Particularly, credit is due Bob Lambert, who is in charge of our Advisory Service and who has had general responsibility for the Conference; Mary Owen, who has very capably handled all the numerous details and arrangements which are so necessary in getting a show like this on the road; and also John Caffrey, who (although regretably no longer on our staff) was very helpful in the initial planning of this meeting.

Finally, in advance, I want to express our appreciation to the participants who agreed to be here. After all, we can make all the arrangements, but they are the ones who really make the Conference.

My only other duty (and this is a very pleasant one) is to introduce to you the Chairman, a person whom many of you already know well. He is really a rarity in the fact that he is a Native Son. He was born and went through public schools in Pasadena, and he took his Bachelor's Degree at the University of California at Los Angeles. He apparently thought better of it and went from there to the University of Southern California, where he received not only one, but two Master's Degrees and his Ph.D.

He might almost be subject to the accusation of being a "house man", since he did work as a Research Associate in the Princeton Office of Educational Testing

Service for a while at the same time he was on the faculty of Princeton University. He has served as a social scientist for the Rand Corporation. He has written numerous articles for professional journals and is on the Editorial Board of Educational and Psychological Measurement.

However, his interests and activities are not all professional. He assures me that equal to the professional interests are his interests in such things as Wil Wright's ice cream, horror and science fiction films, and such general things as traveling, reading, and good food in general.

If nothing else, his present position as Director of the Testing Bureau and Professor of Psychology and Education at the University of Southern California should certainly qualify him to serve as Chairman for this meeting. I am very happy to have the opportunity now to turn the rest of the meeting over to William B. Michael.

GENERAL CHAIRMAN WILLIAM B. MICHAEL: Thank you very much, John. I think that our theme for today, "Testing for the Discovery and Development of Human Talent" is a most appropriate one. I do not know whether the early launching of the Russian satellite encouraged us to pick this particular topic for today, but it is certainly a fitting one in view of the increased emphasis being placed on science and technology and the efforts being expended to utilize manpower to a maximum degree. Obviously, this rests upon our ability, in public schools and in colleges, to improve the instructional offerings in almost every way we can. Of course, those of us who are in the testing field believe that we can use tests to a great extent to assist teachers in improving the learning process, in evaluating just how well both student and teacher are performing, and in picking out those boys and girls who show great promise of future success in the fields of science, engineering, business, and other areas of creative endeavor.

Our first speaker is also a native of the West Coast. She is a fourth generation Oregonian. Her great-grandparents mingled with the Indians. I found out last night that she and I have at least one characteristic in common. Both of us have great difficulty in getting up during the early morning hours. We do not start to function until ten or eleven in the morning - and sometimes not until noon. However, when I talked with her a few minutes ago, she seemed to be in very high gear.

I am sure she will present us with a great deal of helpful information. I know that we are going to have our understanding broadened through her very fine presentation. She is going to talk to us on "A Guidance Person's Approach to Testing for the Discovery and Development of Human Talent". She is certainly well qualified for her important role in the program. She has served as Supervisor of Guidance and Counseling Service in the Portland Public Schools for a number of years and has been associated with the gifted child project which is being conducted there. She has done a great deal of work in the field, including graduate studies at Columbia, Washington, and the University of Portland. It is with a great deal of pleasure that I introduce to you Frances McGill.

A GUIDANCE PERSON'S APPROACH TO TESTING FOR THE DISCOVERY AND DEVELOPMENT OF HUMAN TALENT

FRANCES D. MCGILL

Guidance a few years ago was narrow in scope and was seen as an auxiliary service to the educational program. Today it is broad in principle and application and has moved from a separated program into the main stream of education.

The guidance philosophy, with its emphasis upon the understanding of the individual, and its provisions for individual differences, has become the philosophy of all good educators. When staff members in administration, curriculum and instruction, supervision and research join with guidance staff in a unified approach to education, then it is possible to convert philosophy into reality by providing a program premised upon the discovery and development of human talent.

In this kind of setting, the role of guidance becomes one of implementing the means of discovery of human talent and of working with curriculum and instruction so that the development of human talent is stimulated as a result of discovery. In this setting, the approach to education is focused upon individual pupils. What do we need to know about them so we can offer them the kind of experiences that will assure full and steady growth?

We know that teachers and counselors, through observation and personal contact, can furnish a great deal of pertinent information about individual pupils, but we also know the limitations of these sources of information.

The approach to testing, then, is to determine what information is needed to supplement teacher-derived data, and to set up procedures for obtaining and using such information.

I have found that there is not always agreement between guidance personnel and other educators as to the purposes and uses of tests. To promote such harmony, a minimum testing committee was established in Portland in 1947. It was set up as a permanent committee whose functions were to study the existing testing program, to work toward the development of a testing program for all twelve grades, to encourage experimentation in the use of tests, to act as a clearing house for information about tests used by individuals and schools, and to promote better use of tests. Simultaneously with the establishment of the minimum testing committee, a permanent cumulative record committee was set up under the supervisor of guidance and counseling for the study and improvement of the cumulative record.

In preparation for this Conference, I reviewed some of the minutes of meetings of these committees over the years. I saw Portland's testing in retrospect and realized that the changes in their cumulative effect had been rather spectacular. Membership on these committees cut across staff lines and included a member of the superintendent's staff, research director, director of curriculum and

instruction, supervisor of guidance and counseling, high school and elementary administrators, teachers and counselors.

I believe that directing the attention of this cross-section of school personnel to the study of the testing program was the beginning of the gradual development of a unified approach to testing and the use of test results. In iation at the same time of a compulsory in-service training program made it possible to enlist broad participation by teachers and principals in studying the same problems the committees were studying.

By working and learning together, gradually there has emerged a city-wide minimum testing progra or the elementary and secondary schools. It is systematic and sequential, provi ng information at regular intervals and at points of decision. It is flexible enough to provide for the mobility of our population. It provides for testing that is supplementary to the minimum program. It is flexible in that it permits test experimentation within the framework.

Following are some of the changes that have been made in our testing program during the last eleven years.

Formerly, achievement tests were administered each fall and each spring to grades four through eight. Teachers felt they were being evaluated, and this resulted in some undesirable attitudes toward standardized tests. Now, we administer achievement tests in the spring to pupils in grades three, five, and seven, and score them centrally. The emphasis is upon the assessment of the pupils' status at these points; and teachers, instead of having negative attitudes toward tests, see them and use them as one source of evaluating pupils' strengths and weaknesses.

Formerly, statistical reports of city-wide achievement test results were issued to newspapers. Today, the school administration, through open Board meetings and the release of descriptive, interpretive reports on the school curriculum, keep the public well informed.

Formerly, reports comparing achievement in the elementary schools were issued to school principals. The failure to take into account the many factors that affect pupils' achievement brought discouragement to some and false complacency to others. It formerly was the practice to rotate achievement tests from year to year; that is, to use tests from different publishers. The purpose in mind was to keep teachers from teaching toward the content of a particular test. Since teachers no longer feel they are being evaluated, this is no longer necessary. Using the same battery at different levels makes possible a more systematic longitudinal evaluation, of a general nature, of pupils' growth, since the data are more comparable.

Formerly, intelligence tests were administered and scored by teachers in the elementary schools. After a systematic check of the scoring had been made a few times, we moved to the use of psychometrists, who now administer group intelligence tests at the third and seventh grades. The third grade test is hand scored and the seventh grade test is machine scored. For the past two years,

we have given individual psychological examinations to all pupils whose I.Q.'s were 80 or below on the third grade group test.

Formerly, special programs, such as Special Education, sponsored independent testing programs, the results of which were seldom shared. Now the minimum testing program provides for supplementary testing when a more diagnostic or different type of test is needed. Consultation precedes the selection of such tests, and all results are returned to the schools and recorded in the cumulative records.

Formerly, there was a redundant achievement testing program in the elementary schools and none in the high schools. Impulsive, sporadic testing by different departments was a fairly typical high school pattern. Now, we administer a comprehensive test battery at the ninth and eleventh grades in the fall. These test results are placed in the hands of all teachers, accompanied by aids to interpretation and suggestions for their use. Extensive use is made of this information by counselors and by teachers, individually and in groups, as members of curriculum study committees.

Formerly, the cumulative records in the elementary schools bulged with intelligence and achievement test booklets, unrecorded. Now, results of all tests are recorded on a test insert, which is a part of the cumulative record.

In making these changes, the minimum testing committee kept in mind the kinds of information people indicated they needed and wanted to use. Guidance personnel were interested in identifying general abilities and aptitudes and in finding clues to unique combinations of abilities and limitations to help in planning with pupils. Teachers were interested in pupils' status and in cues to help in individualizing instruction. Pupils were interested in test information that would assist them in self-appraisal and in setting realistic goals. Parents were interested in objective data about their children's potential, so they could plan. Administrators were interested in use of tests for public relations, and they developed a plan whereby teachers present to parents, in individual conferences, test information in its proper context.

Discovery is only half of the picture. Development follows discovery when curriculum and guidance work together in studying needs and ranges of differences revealed by testing and in adjusting the curriculum to meet these needs and differences. This necessitates curriculum committees in all subject fields working continuously in the development of units and courses and in revision of courses and content. Follow-up studies of graduates are needed to provide information to sharpen counselors' skills in use of test results in evaluation and prediction.

Now I shall try to give a few examples of what happens after discovery.

Special curriculum offerings begin at the fourth grade with the introduction of the usual special education programs. Guides for use of the intelligence and achievement tests given in the third grade are prepared for teachers to assist them in making referrals for placement of pupils in these programs. The referral of a pupil by a teacher at any time is given prompt attention. Usually,

referrals call for supplementary testing, which may range from a diagnostic reading test to an individual psychological examination.

At the fifth grade, the Gifted Child Program offers curriculum enrichment and new experiences. Again, the teachers begin with the group test information; and approximately ten percent of the pupils are given an upper level form of an intelligence test, which provides a higher ceiling in the measurement. Teachers then give all fifth grade pupils talent exercises or tests designed to identify giftedness in art, music, creative writing, and creative dramatics. Placement in a special program follows identification. Enriched curriculum is provided through special grouping in the areas of language arts, mathematics, and science. Foreign languages are offered also. Both the Special Education and the Gifted Child Program continue through the twelve grades.

The eighth grade is an example of a point of decision in which choices of curriculum and choice of a high school are to be made. The "Bridging-the-Gap" program is our "pedagese" for the period of transition from elementary to high school, which takes place in March and April each year. It is a well-coordinated program, in which the elementary school and the high school work together in reviewing and interpreting pupil data and in relating them to the ninth grade curriculum. Test data play an important role in this planning for placement. In addition to ninth grade courses for gifted pupils, there are also advanced placement opportunities in science and foreign language.

In making some decisions, we feel the addition of test results of a different kind are of great assistance. One such decision is determining whether an eighth grade pupil should take general math or algebra. The arithmetic scores of the achievement test and teacher judgment were found to be invalid predictors. Adding an algebra aptitude test score seems to improve teacher judgment in guidance toward placement.

The language arts supervisor, with committees of teachers and guidance personnel, several years ago - before Flesch - reworked the tenth grade program. Reading was given special emphasis; that is, different kinds of reading skills to serve different purposes in reading. The committee reviewed reading tests for months. They selected one, and it became a part of the minimum testing program. Early in the fall, psychometrists administer this reading test. Results are placed in the hands of all tenth grade language arts and social studies teachers, as well as the counseling staff. These test data serve as a springboard for the teaching of reading. They afford another opportunity for the discovery of pupils who need remedial reading. They also serve to motivate pupils to elect "Effective Reading", which supplements the language arts classroom work through grades eleven and twelve. "Effective Reading" is designed for bright, able pupils, whose reading rate or percentage of comprehension may be a handicap to them, or who may, in some instances, simply wish to improve their reading skills. This new curriculum offering came as a result of teachers' studying test results.

A Career unit in the tenth grade provides the opportunity for uses of a college

aptitude test and an interest inventory. This testing, we feel, is meaningful to pupils because it fits into a curriculum setting and because the tenth grade is another point of decision in the selection of electives for the eleventh and twelfth grades, depending upon "Are you or aren't you planning for college?". Individual counseling follows the teaching of this unit, and often the test results influence some change in plans.

A mathematics test is administered by psychometrists to all eleventh grade pupils as a survey test. Counselors and mathematics teachers share these test results and other pupil data including scholastic aptitude to help them in counseling some pupils toward remedial mathematics or consumer mathematics in the twelfth grade.

I need mention that each high school has a trained test coordinator as a member of the counseling staff. Counselors and teachers who find pupils with inadequate test information, pupils whose test results seem inaccurate, or pupils for whom they need more analytical test information, may call upon the test coordinator. In consultation with the guidance office, he arranges for test supplies, arranges for a psychometrist, or may administer the tests himself. In his other role, the test coordinator distributes test results to the school staff and assists teachers in the interpretation and use of this information.

Efficient discovery and effective development of human talent is a total school responsibility. Gradations of staff responsibility, clearly delineated, enable each person on the educational staff to function as a member of the guidance team.

Schools are able to do a better job of discovery today because there are better tools available. Improved practices in test development and research on the part of test producers have brought to the market instruments that enable schools to do a much better job of identification and counseling than was possible twenty years ago.

Similarly, some achievement tests have been produced which enable schools to do a better job of evaluating pupils' development. These tests use the problem-solving approach, which is helpful to teachers and counselors, as the results indicate what a pupil can do with what he has learned.

The content of these tests has been developed through the use of committees of teachers, selected from schools in many sections of the country, recognized for good curriculum development and practices. It used to be said by educators that achievement tests stifled curriculum development. These tests encourage modern curriculum development and the problem-solving approach to teaching.

With careful selection and use of well constructed, dependable tests, and cooperative planning by the school staff, discovery and development of human talent is a challenge every school can meet.

CHAIRMAN MICHAEL: We have about five minutes for questions from the floor.

THELMA E. DAWES (Director of Testing and Evaluation, Taft City Schools, Taft,

California): Are your fifth grade tests hand scored or machine scored? You mentioned that the seventh grade tests are machine scored and the third grade tests are hand scored.

MISS McGILL: Hand scored.

MISS DAWES: They are not machine scored below the seventh grade, is that correct?

MISS McGILL: Oh - no, that is incorrect. Some are machine scored below the fifth grade.

MR. FOX (President, Punahou School, Honolulu, T. H.): You said that you gave the achievement test in the spring in the elementary schools. Why aren't they given in the fall - in October, for example - in order that the teacher might have more time during the year to individualize her instruction?

MISS McGILL: You may have noticed I made mention of the fact that we operated in a democratic way. That implies that one makes compromises. There are many things, really, that are not entirely satisfactory. Because we have this committee, we can move ahead; but we do move slowly. I say spring; they are given in February. It is a compromise. I agree with you. We would like them given in the fall.

WILLIAM WRIGHT (School Psychometrist, Rowland School District, La Puente, California): You mentioned test coordinators, counselors, school psychometrists. What ratio of these personnel do you have to your student enrollment?

MISS McGILL: It is not nearly as good as it should be. I really don't know the exact ratio. I would say about one to a thousand students for the test coordinators. In each of the eleven high schools there is a test coordinator who has periods in proportion to the size of the school and the kind of job that has to be done. This ranges from one to two periods per day. The counseling in Portland is done by teacher-counselors. Counselors are given time in proportion to the number of pupils they have as counselees. That ratio is about sixty to a period. The important thing, I think, is the fact that after blood, sweat and tears, we have secretaries in the counseling offices.

Perhaps I should be a bit more explicit about the personnel and ratios. The typical high school counseling staff includes eight to twelve counselors. Two or three counselors are assigned to each grade, nine through twelve, depending upon the number of pupils. Each counselor carries a counseling load of approximately two hundred counselees, at a ratio of sixty pupils per period, and they accompany these pupils throughout the four years. A counselor for two hundred pupils is assigned four fifty-five minute periods for counseling each day, and teaches two classes each day.

Additional members of the counseling staff coordinate auxiliary guidance services. These are the vocational counselor, the college and scholarship

information coordinator, and the test coordinator. These programs and the time allotted for them are in addition to the basic time allotment of sixty pupils per counseling period.

A staff of four psychometrists (group testers who work eleven months a year) administer intelligence tests in the elementary schools, and college aptitude, reading and mathematics tests in the high schools. They coordinate the achievement testing program in the high schools. The achievement testing in both elementary and high schools is done by teachers.

JOHN A.R. WILSON (Assistant Professor of Education, University of California, Santa Barbara): You mentioned a career unit in the tenth grade, and that immediately following the completion of the career unit there was an individual conference with these students. I would like to ask two things. First, who is responsible for giving or teaching the career unit? Secondly, does the person who teaches the career unit then interview, and to what extent is the guidance personnel brought into this very vital problem?

MISS McGILL: A schedule is worked out so that the unit is taught in each school following a staggered schedule. The unit is taught throughout the year, and in this way the vocational material in the library is available in total to each class. Observation of jobs and student interviews of employed personnel are spaced, and the test interpretation by the counselor, following the teaching of the unit, is spread throughout the year. The activities accompanying the teaching of the unit and the follow-up by the counselor would not be possible if every class studied the unit at the same time.

The English teachers administer the interest test. The psychometrists administer the college aptitude test. Test results from the ninth grade program are placed in the hands of the tenth grade teachers. There is continuous training of these teachers through formal meetings and informal methods. New teachers of English are given special training. I would say they do only a general kind of interpretation. It is the counselor who really provides the individual interpretation through counseling, and relates this information to curriculum planning to assist the pupil to set and plan for a post-high school goal.

LOIS LANGLAND (Counseling Psychologist, University of California Student Counseling Center, University of California, Los Angeles): Does your program extend to working with Reed College? I was wondering about that.

MISS McGILL: I would say that that is perhaps the greatest single result of the gifted child program in Portland. By that, I mean the upgrading of teachers. The program was a five-year program. In the design of that program, Reed College faculty members worked with teachers selected to teach courses in the gifted child program. There were classes that went through the school year and the summer workshops. The reason that I think the results have been so valuable is that a teacher who teaches some courses to the endowed youngsters teaches other youngsters too. Teachers who learn how to teach better improve the instructional program for all children.

CHAIRMAN MICHAEL: Our next speaker is also a Native Son of the West Coast. Dr. Roy Wahle is Assistant Superintendent of Schools in the Bellevue Public Schools, Bellevue, Washington. This is the largest growing district anywhere in the Northwest. Roy told me that something like three hundred and fifty new teachers were added to his system last year, and Bellevue plans on adding another hundred this autumn.

Roy Wahle is a person with a very diversified experience in the area of education. He has served as a teacher in elementary school, in junior and senior high schools, and college. He has been an elementary school principal, and he has been active in guidance work and curriculum supervision at the high school level. Currently, he is Assistant Superintendent in charge of guidance and instructional services in Bellevue. He has recently been appointed a member of the Board of Trustees of the Central Washington College of Education. In addition to all his other achievements, he is a Certified Psychologist in the State of Washington.

Roy Wahle will address us today on "The Instructional Uses of Measurement in the Discovery and Development of Human Talent". He will draw on his large experience, and in a highly integrated and coordinated fashion, show how the various aspects of the educational program tie into the measurement procedure.

THE INSTRUCTIONAL USES OF MEASUREMENT IN THE DISCOVERY AND DEVELOPMENT OF HUMAN TALENT

ROY P. WAHLE

I wanted to suggest to you first that I have been in California for a week. This area is new to me. Although I have encountered no smog, apparently the night life has caught up with me in more ways than one. First of all, I want to put the record straight. I know that during the very fine dinner party last evening certain social amenities took place. We discussed various things, and apparently I must have said that we added three hundred and fifty teachers last year. We actually added one hundred. One fact is quite accurate, however. I am rather proud of that, because the question was asked later in the evening, "How many teachers will you add next year?". I did say one hundred, and that is accurate.

"The Instructional Uses of Measurement in the Discovery and Development of Human Talent" - I must admit that when I first saw this topic, I pondered; and I freely admitted that I didn't quite know what it meant. Then as I continued to think about it through California - and particularly at the A.A.S.A. Convention in San Francisco - I tore up what few ideas I had and examples that I had brought with me from my own district and started afresh. This, I will admit, is also the product of a little night life and some thinking in hotel rooms - not always the most inspirational place to think. I did write these thoughts down. This is a rather new experience for me, because I had learned a long time ago from a

very fine debate coach that if one commits these ideas to paper, his voice and tempo change and he loses his audience. One should always speak extemporaneously from notes. For some reason (perhaps from my religious background), I usually talk with notes in terms of three points. I presume this is not a superstition. At least, I would like to think so. However, I got lost in points here. I am sure there are a few more than three, but whatever I do say comes from the heart. I trust that it has passed through the head as well.

I am a doer of deeds. Some would say that I am a practical man of affairs. I am a teacher and school administrator imbued with subject matter and skilled with budget "buffoonery". I can manipulate things and things, but I tremble at the sight of a child. He is neither a solitary fact, nor a monetary design; he is not a thing. He symbolizes nothing but himself. He is mankind. He is our universe! He possesses a sacred personality and a potential individuality - he is unique to all of his history - no one has been or ever will be like him again. In him rest our past, our present, and our future in a charming and turbulent unity. A child is a tremendous reality. Yet, no one knows what a child is - his potential seems unfathomable; his accomplishments seem restricted by our lack of faith in him, our fear to dream with him, and our pitiful lack of knowledge about him.

Surely, there must be some who are now alive who could be as great as Moses or Elias, as brilliant or as creative as Da Vinci and Newton, or as hopeful as Jefferson. Must we conjecture that the world has never known and does not now know how to find its greatest men! If you are a teacher, you should allow the thought of human potential - its challenge, its realization, and its waste - to plague you just a little.

It is no new discovery, but it is a discovery ever to be renewed, that we know little about human talent: what it is, how it affects the world around it, how to discover and develop it. The teacher must rediscover and re-evaluate a child's potential each day. He and the child must <u>live</u> together in the classroom.

A teacher is a doer of deeds, continuously, because life is continuous. We teachers often do not know or are not certain about what we are doing, because, in the broad perspective of our work, so little is known to be exact. We work with such indefinitudes as capacity and potential, personality and love, relativity and destiny. Mankind yearns for certainty and attempts to fix it where human reason cannot readily find it - and some among us appear to believe that human knowledge encompasses no certainty anywhere.

The age of science is upon us. Everywhere its deliverance pours out blessings and glimpses of tragedy. Science is a spirit - it is a way of looking at things. It attempts to de-humanize the intellect so that analysis can precede synthesis, so that reality can be faced in degrees and categories, in relationships and patterns. The heart of science is attempted objectivity; its mind is alleged "facts", its weapon is the measuring device, and its products are tentative conclusions with which to guide momentary action. With new evidence, these conclusions may become the hypotheses of tomorrow. Some students of science persist with their assumption that all things which exist do <u>so</u> exist in some degree, and, therefore,

can be measured in some degree. No reputable practitioner, in the educational efforts about which I know, will deny this essential nature of scientific methodology nor the beauty of its gifts. But science in our time is being accorded more than a spirit of discovery which more careful measurements may reveal. There need be no aura to science nor halos about the scientist as if he represented a new-found savior of mankind.

Moreover, we may need to contemplate that education appears to be more nearly submerged in the weaknesses of the social sciences rather than in the strengths of the natural sciences. Graduate students' dissertations and theses may abound in statistical froth signifying very little, due to the mistaken notion that the only language of science is mathematics. The inability of a child to read does not become any more real because he fails in seven attempts to extract meaning from a given set of printed symbols on seven different evenly-spaced days at seven o'clock on each day. He may not be able to read because no one believes he can! Belief and love are difficult to subject to a sigma. However, a spirit of scientific inquiry (and its objectivity), using mathematics or statistical concepts (not for prestige, but for meaning) may assist the student of education and the teacher to seek experimental "solutions" to the way the child looks at his world and his interaction with it. Scientists may attempt to give us equated pieces of thought so that we may better manipulate our whole thoughts. No amount of measurement will substitute for thinking, nor will analysis substitute for insight.

Thus far I have attempted to say these things:

1. My discussion topic could be misconstrued because it points to the discovery and development of human talent as if talent were a sinew and not a whole body. I want never, as an educator, to lose sight of the human nature and sacredness of Johnny and Mary, his sister. So I shall speak about talent as a glimpse of somebody rather than a part of anybody.

2. Teachers and all other educators cannot lose sight of the individuality and personal potential of each child; the former they must cherish, and the latter they must ever seek to inspire to its fullness.

3. Scientific knowledge about the child and how he functions is limited, but we are not using well what we already know.

4. The scientific approach to knowledge must be dominated by our philosophy out of which our significant hunches or hypotheses may rise. The scientific approach should not obscure the total child in the rigors of scientific ritualism. It is an essential mental activity to analyze the child in his myriad functionings, but no one is real unless he is somehow re-assembled into life.

I have spent some time with an emphasis upon the wholeness and integrity of the child so that anything that might be said about his talent, his instruction, or his measurement will not add to the current confusion about the child and his schools.

I do not minimize society's legitimate demands upon the individual, but I am not fearful that we are losing sight of this relationship. My concern is that the needs of society as they are described in America today are enveloping and obscuring individuality.

It would seem that our people are ridden with a new disease which could be called "assumptionitis". Let us examine some of the bold assumptions about what schools are doing, or concerning what schools ought to do, in today's America:

1. The superintendent of a large city school system suggests that there exists a public mandate for the schools to examine their programs with the idea of doing a more "solid" job. But before the examination begins, he already assumes that a crack-down on educational laggards, a stepped-up program for those who can assimilate a heavier schedule, and selection (at the time a child has reached or is in the eighth grade of school) of college preparatory work should be accomplished.

2. The dean of a college of education is reported to have asserted that education should be less interested in what people need than in what they ought to have. He assumes that learning has little to do with meeting current needs.

3. A highly respected former college president assumes that all able pupils should master (through three years of hard work): one foreign language, three years of mathematics, in addition to physics, chemistry, and biology.

4. A great engineer in my home state has asserted that children in the state of Washington are low-speed, low-comprehension readers.

5. It would appear that some educators assume that guidance and counseling are more concerned with the danger of sputniks than with pupils themselves. According to these educators, counseling will concern itself with the problems of the physics class and mathematical preparation for physics rather than with the pupil who is enrolled in the course.

6. An American religious leader assumes that our democracy may best be served by a track system of education; he advocates two kinds of high schools and colleges: one standard, the other honor.

7. The public and some educators appear to assume that the launching of a new earth satellite is a scientific achievement. They further assume that more "cook-book" courses in physics or chemistry may re-establish America's pre-eminence in the grasp of scientific thought.

America may be headed for tragedy in a tempest of startling confusion. What strange, unfathomable twist permits the people of our great nation - a nation whose power and glory rests in its hard-earned Judao-Christian respect for each human

being, whose power and glory is enhanced by its science and technological wonders, whose contribution to the societies of the world is its working democracy - what twist permits some among our influential educators to assume that society's needs are different and more sacred than a child's needs?

What happens to some of our scientists who apparently abandon all semblance of the scientific techniques concerning problem examination and study when they encounter the phenomenon of today's youth and their proper education? Some scientists disgorge hypotheses as if they were immutable verities and treat assumptions as fixed laws. Our nation may be growing ill with "assumptionitis".

We may know that the currently successful attempts to rival the ancient moon with speaking satellites is an achievement of technology. It is based upon scientific conclusions of Isaac Newton and others who truly felt the impact of falling apples over three hundred years ago.

What a debacle indeed, if we should begin worshipping technology as science rather than as one gift of science, and thus stifle the creative genius and enthrone technological advances in his place.

What new revelation has been visited upon a few voluble college professors, educators, scientists, religious leaders, and laymen, that they may now prescribe for all without a clear statement of philosophy, without hypotheses, without evidence, and without experimentation?

Are we moving to the position of the enemy in support of his notion that the individual is less than society? Are we to adopt an educational system which ostensibly supports a government we do not trust, an economic system we suspect, and a philosophy of life we abhor?

Are we to enter the true dark age of human thought because we are becoming men of muddled and aimless actions before we think and study, learn and plan?

Where is the proof (I have not seen it) that most of our schools are not already doing many things which some critics say they are not?

If it is concluded that a whole state's children are low-speed, low-comprehension readers, should not such conclusions be preceded by definitions and documentation?

There is no reason that one should instruct unless the instruction is for some one concerning some thing. If America's contagious and distorting disease of "assumptionitis" is not soon diagnosed and destroyed, instruction may become indoctrination, and our democracy may become a farce.

Instruction for conformity rather than individuality could become the mode. Society will compress the individual, and may then succumb in its own straitjacket of uniformity. America may disintegrate in our life-time without the dignity of a missiled holocaust - we shall have lost the cold war without a shot

being fired. Society as an organism may emerge supreme in the world, and each human being may find himself so burdened by the distresses of his individual differences that he will become a brother to the ant.

How can I say more strongly that I am concerned about the instructional uses of measurement in the discovery and development of human talent. I speak with deep concern about instruction for individual children in a democracy, for measurement that does not de-humanize a sacred personality, and of talent that is an integral part of the child, his society and his environment.

It seems most acceptable that teaching or instruction should determine what is to be measured. The processes or procedures of measurement should not determine what is to be included in the instructional program. Moreover, measurement should assist in the evaluation of the nature of the understandings which the child perceives.

The scientists, who are complimented by the name of psychologists, have given much to education. Not so many years ago, psychology examined as an hypothesis the doctrine of mental discipline which humanity for centuries had assumed to be a truth. The mind, under this notion, was to be likened to a muscle. Give the mind exercise in "tough, solid" intellectual pursuits and an educated man would emerge. He could then delve into new thought, which may have been related to this "tough, solid" learning, and proceed with discernment and productivity.

No evidence was found to support this substantive or mental disciplinary hypothesis. The concept of the Mind, as a receptacle or a tabla rasa, was offered as an hypothesis. After no support was obtainable from the study of data which were pertinent to this concept, it, too, was abandoned. Facetiously, some refer to this concept as the defunct "cuspidor" theory.

We have now come to live with our minds as a function of our total individuality. No one knows exactly what electricity is, but we use this form of energy to light our lives. No one knows what the mind is, but we assume that observable behavior communicates our consciousnesses and our existences to one another.

Education, we suggest, is a modification of behavior. As an educator and as a psychologist, I have been grateful to my science, for its investigation of the mind, its working definition, and its implications for education everywhere.

But, where are our psychologists now? Their science is being trampled upon. Their concepts are being disregarded as if the science of psychology were meager and unrelated. Would not a nuclear physicist be tempted, at least, to hurl a cobalt bomb at the blue Pacific if we, as a nation, would not respect his developing concepts of matter - energy relationship?

Dr. Arthur Bestor dares to address the nation as if mental discipline were a reality - and the psychologist should acknowledge this flamboyant caricature of the findings of his young and virile science.

In this fascinating time, when the world needs the leadership of men of compassion, understanding and conviction, it is good that we should meet here under the auspices of an organization dedicated to service. If we believe in people, we shall wish to help them discover and develop themselves. This is service in its highest form. Society can reach its greatest creativity if individuals who join to form society know more and more about themselves.

Instruction must be concerned with the variety of interests and abilities within each child which give satisfactions in the present and promise for the future.

The course of study which promulgates subject matter without reference to the child is inimical to the child's precious gift of being. An educational measuring device which supports those who would forget the child and his needs and purposes, which portends his future, becomes a tool of a madman. It destroys and does not build. A testing program which ceases to emphasize service to the child alone may create a new dependence upon the test maker rather than upon the increasing self-dependence of the child and the diminishing assistance of his teacher.

For many years, we schoolmen who are on the village frontiers of education in our nation's public schools have expressed our deep concern about the strangle-hold of the Carnegie unit of measuring supposed competency by ticks of the clock. We have objected to antiquated college requirements which are often based upon how long a pupil has sat in a high school class and the names of courses to which he has been exposed.

In our attempts to rectify these questionable procedures of doubtful validity, let us not proceed to a newer concept more fallacious than the first.

It would be ironical indeed, if measurement movements, in the name of better understanding of individual potential, would loose upon our country the antithesis of individuality.

State-wide testing programs improperly interpreted may place instructional content and methods in jeopardy of conformity.

State-wide systems of testing may inevitably increase emphasis upon norms. Tests may become goals rather than tools of measurement. Objectives for the instructional program may degenerate into facts and relationships to be memorized, in order to pass over the hurdle of the tests, rather than understandings and insights to be acquired.

Generalized college entrance examinations, interpreted against a background of national norms, may rally uninformed and hopeful parents into an acceptance of another's standards of mediocrity.

School administrators may become harassed with parental demands that each high school's curriculum must conform to the implications of the uniform examinations.

When the outcome of measurement migrates towards sameness and conformity, towards similar standards for different people, we are perverting measurement and its service to instruction. Measurement, the process, becomes supreme. Instructional creativity prostrates before indoctrination, and individuality is crushed.

The illness of our time is conformity. Its form and spirit is symbolized in our automobiles, our highways, the row houses, the repetitious super-markets, and the daily brain-wash of TV offerings. Monotonous sameness is everywhere evident in modern life and its spawning suburbia. Even school houses and school teachers are beginning to look alike in our new cities which feel alike. True community life is threatened by all these developments.

Through better observational techniques, which are enhanced by measurement, we may yet preserve the dignity of each child. We cannot allow the tool to become the master at a time when society in its illness may conform to measurement's answers as if they were solutions.

Prognosis in our nation's schools relates to matters including reading readiness, grouping, personality development, maturation, scholarship, and predictions of vocational adjustment.

In Bellevue, Washington, we use measurement for all these purposes. We attempt to give great honor to the individual, and our case-study approach lends support to our devotion. We derive norms in group testing as a device to sensitize our hope for each child. We look for patterns of development in our instructional endeavors, including those we consciously encourage and those we may have unwittingly permitted to emerge. When we know more about each child, we know more about his needs and purposes. We then are enabled to proceed to learn more about each group of children.

We respect the individuality and creativity of each teacher no less than each child. Our measurement program is designed to help find how better to instruct each child. An insecure teacher neither instructs well nor fulfills his own ideals for service to a child.

We in Bellevue have assiduously avoided a "testing cult". We do not, at the first sign of difficulty, call the psychometrist to "pray over" the child and divorce the teacher from the scene. We attempt to hold testing and measurement processes in what we believe to be their proper relationships - namely, more nearly refined methods of human observation. The teacher or professional educator is the key, and measurement techniques afford intelligent observers their essential tools with which to understand and to better predict human behavior.

It has been my pleasure to talk with you about my concerns with the instructional uses of measurement as they may affect the sacred personality of the child, and the use of science to better understand and predict each child's behaviors. My concerns have been expressed about currently popular discussions and professional statements as these phenomena may, in our current evaluation of American education, cause measurement to ascend an uneasy throne over the entire

educational plan for our country.

Keener predictions of behavior may permit greater possibilities for modification, but the greater control of human development which all this renders possible must continue to be submissive to our democratic ideals of freedom and individuality.

I do not believe that the destiny of Mankind moves in aimless circles.

LES WIGGER (Assistant Head, Psychology Department; Co-Director of the Psychology Speech Clinic, Pepperdine College, Los Angeles): I attempt to teach educational psychology. What Dr. Wahle has just said is right in my backyard. I can't say it nearly as well as Dr. Wahle has said it; but when I do attempt to communicate these concepts and ideas, the charge is frequently leveled, "Well, aren't you talking about an idealistic society? You take this view of the human personality. Aren't you talking about Utopia?" Maybe you would care to respond to such a concept.

DR. WAHLE: I could respond, I suppose, with over-simplification. I think it may be as simple as all this: If I understand the struggle for the human mind and heart today in the world (and perhaps I don't), there is a simple struggle as to which entity is supreme - is society the servant of the people, or are the people subservient to society? Again, if I understand this, the enemy that we often refer to - most nearly represented and personified as Russia - is debasing what perhaps we learned from ancient man. I don't know who initiated this concern about man and his society. Maybe Abraham did when he walked out from the desert for the first time and said, "I am greater than the stone; I am greater than the donkey." We preserve this idea. It has been the basis for our Western Civilization. I don't see any Utopia in saying that I am more important than a rock or more important than the totality of the society of which I am one precious individual, that I am made in the image and likeness of my Creator.

In the United States and in the Western World, in the Islamic World, in India with Mahatma Gandhi - if I understand what these people are trying to say - human beings are simply asking (not in terms of Utopia, but in terms of reality), "Are <u>you</u> important, or is the totality of society more important?"

If I begin to follow the line of thinking that seems to dominate the interpretations in some sections of the press, I must forget the child. I talked for half the morning about this wonderful child whom I don't know. I really feel that that is what we are losing. I do not think that this kind of thinking is any more idealistic than it is real. The child is real. So is society. Both have needs. But the child's needs are primary.

JOHN A. R. WILSON (Assistant Professor of Education, University of California, Santa Barbara): There is something that bothers me about this approach to the ideal of the child. That is, there seems to be a general tendency to be afraid of measuring just what it is that we are trying to do when we are working with the individual child. We are afraid of measurement as being a tendency to put everybody into the same mold. I am a little bit concerned that sometimes in the name of the sacred child we push him into another mold that may be more undesirable, and we

sort of close our eyes to this possibility and do not attempt to measure just exactly what we are doing to these children.

DR. WAHLE: I think the point is well taken. The comment that I should like to add, if I may, is that we should keep our perspective that the child is an integrated whole. That is, if we tear him apart, we can study a sinew or a toe-nail. We do not then have a child.

I was warned the other day that as far as being a psychologist is concerned (and I must admit that I am more of an administrator than a psychologist at the present time) a fellow educator said to me, "Your days are numbered. The biochemists are taking over. We'll do it all with a needle." This may be true. I view that statement with a little trepidation because it is a vast unknown; but we must enter there, I am sure. But if we advance to this state, we still must remember that to analyze is to try to find out in terms of reason a little more about a totality or a pattern. It is difficult when we see the whole blazing pattern in front of us. Analysis brings things into focus for our weak imaginations. As we pull things apart, we can destroy if we do not put things together again.

I am certainly an exponent of measurement. Maybe I should say facetiously that I wouldn't be here if I were not.

CHAIRMAN MICHAEL: Although our next speaker is not a native of California, he has taken very well to our locale. I do not think it likely that anyone could take him away from California now after a residence here of seventeen or eighteen years.

Dr. J. P. Guilford, who is internationally known as a psychologist, is Past-President of the American Psychological Association, Past-President of the Western Psychological Association, Past-President of the Psychometric Society, a member of the National Academy of Sciences, and a well-known scholar who has published extensively in the professional journals. During World War II, he was extremely active in personnel research, in which he employed factor analysis and other techniques to realize a better understanding of the nature of human aptitudes and to improve the selection of pilots, bombardiers, and navigators in the Air Force. From the time that he finished his important work with the Air Force, he has had a contract at the University of Southern California for the study of "Aptitudes of High-Level Personnel". In this contract, he has been attempting to isolate the various dimensions of human intellect. In studying the nature of creativity, he has added substantially to the basic knowledge of intelligence.

Dr. Guilford, of course, is a close personal friend of mine. I have had the pleasure of working with him as a graduate student, and I completed my doctoral studies with him. I should like to say that he has a very loyal following among his students, who are in various parts of the nation. He is one of the most thoughtful and considerate men that I have ever known. Just to cite an example of one of his kindnesses, when I was isolated in the "Princeton Desert" a number of years ago, I used to think quite fondly of the Wil Wright ice cream available in

Beverly Hills. He offered at one time in a letter to air express some of that ice cream to me. Shortly after his offer, we had an unseasonable heat wave. It reached 96° to 98° with high humidity. I was just afraid to risk a melted quart. Had we had cooler weather, I am sure that I should have taken him up on the generous offer. I had to wait twenty-seven more days before I could return to California and go into the Beverly Hills store. An extremely kind man, he has all the human and other desirable personal qualities to go along with these special characteristics we find in a scholar of exceptional achievement.

Today, Dr. Guilford will talk to us about "New Frontiers of Testing in the Discovery and Development of Human Talent". It is with a great deal of pleasure that I introduce to you Dr. Guilford.

NEW FRONTIERS OF TESTING IN THE DISCOVERY AND DEVELOPMENT OF HUMAN TALENT

J. P. GUILFORD

Thank you, Bill, for that very generous introduction. My paper has almost no humor in it, so I think I should tell you a story to begin with. This story is rather apt on this rainy morning and in this context where we are concerned with testing. At one of our army posts some time ago, a small group of enlisted men were facing the ordeal of taking an intelligence test individually in preparation for selection for officer training. They were outside a small building, waiting to be examined. It was raining. The examiner came out and took in one man, tested him, and then came back for another. He noticed that whenever he came to the door, the men rushed up because everybody wanted to get in. The next time, the examiner said, "Will the most intelligent man in the group please step forward and come in." There was a little pause, and then a tall red-headed fellow toward the back came up and entered. The examiner said, " Well, so you think you're the most intelligent man in the group? " The fellow glanced around and said, "Well, I'm not out there in the rain."

We are often told that we are on the threshold of the age of space, and, although we have not been completely earth-bound for some time, we shall soon be able to leave the earth's atmosphere and eventually be able to roam among the planets. We have been rudely awakened by a couple of Russian-made satellites to a realization that our supposed intellectual superiority is not what we thought it was. We are accepting the challenge of a general intellectual contest, which I think everyone will admit is much to be preferred to a military contest.

Never before has it become so important to know much about our intellectual resources; to know what we need, to know what we have, to know how to make the best use of what we have, and to know how to improve upon what we have wherever that is possible. We are hearing a great clamor and outcry for more trained scientists and engineers. Undoubtedly the need is very great. I would be a little happier, however, if the urgent demand for scientists and engineers were not so restricted to military purposes. It should be recognized that the intellectual

challenge is a much broader one than that. It is necessary for us to meet that challenge on all cultural fronts. It would be too bad to channel all high-IQ students into science and engineering whether they are otherwise well suited to those professions or not. From the standpoint of meeting the intellectual demands on all fronts, it is important for us to find the areas within which individual students will make their greatest contributions, in which they will find their own best opportunities for development, and in which they will achieve the greatest satisfactions.

Limitations of Conventional Tests

Our conventional testing procedures are not adequate to this important task. The IQ test, which is essentially an academic-aptitude test, has served to tell us in general how well prepared an individual is to acquire book learning. There have been exceptions to accurate prediction, as all of us know, but sometimes I think that IQ tests have worked too well; they led us into an attitude of complacency. Today, in addition to IQ tests, most publishers offer a small battery of differential-aptitude tests, each test emphasizing some different aspect of intelligence. This step is a good one, but it does not go far enough and sometimes not in the right directions. By the last statement I mean that not enough attention has been given to basic theory of intellect.

If you will pardon me, I should like to give you a little personal background that will help to explain my attitudes towards tests and testing. When I was a graduate student, which, of course, was quite a few years ago, I had the experience of administering the Stanford-Binet tests and also scales of performance tests to quite a number of children. This experience struck me forcibly in two ways. One distinct impression was that children who have about the same IQ can still be very different intellectually. One child can be very strong in certain respects and weak in others. Where one child is weak another is strong. In a battery of performance tests, for example, it was not uncommon for a child to score all the way from mental-age five to mental-age fifteen in different tests, and these children were not pathological!

The other impression was that the tests sampled relatively the more routine mental operations and gave little opportunity for the child to show what he could do in creative ways. It seemed to me that a genuinely intelligent person would show this by his creative ways of solving problems and by inventive performances. It is sometimes said that today the greatest deficiency in American intellect is its lack of exhibition of imagination. We are told by those who employ our graduates that we do a pretty fair job of teaching textbook information and of developing skills in the use of methods but that our students fall short when they are faced with new problems. Whether our testing and educational practices both reflect a common attitude that is indifferent to creative imagination or whether our choice of test material has given a slant away from education for inventiveness would be hard to say.

Investigations of Intellectual Abilities

A large part of my professional life has been devoted to the investigation of

intellectual abilities. Two very fortunate circumstances have provided unusual opportunities to pursue this objective. During World War II I happened to be engaged in research on intellectual abilities in connection with the selection of Army Air Force aircrew personnel. Since the war, the Navy and the Air Force have given us generous financial support for research in an Aptitudes Project.[1] In both connections, my associates and I have used the procedure known as multiple-factor analysis, which was developed in this country by L. L. Thurstone about twenty-five years ago. It is sufficient for our purposes today to say that multiple-factor analysis is a statistical procedure that enables us to classify tests of different kinds. The classification is based upon the way in which tests intercorrelate with one another. The basic theory includes the belief that where two or more tests are intercorrelated there is at least one underlying ability or trait involved; a common factor. If the analysis is properly planned and executed, each common factor appears to have a rational, psychological meaning. The factors found in aptitude tests Thurstone called "primary mental abilities".

Our own research in the aptitudes project has been concentrated upon abilities to think and to reason, upon creative-thinking abilities, planning abilities, and abilities to evaluate ideas and solutions. Our efforts have been directed to the development of a great variety of tests, mainly of types unknown before, in an effort to let no kind of intellectual performance go unexplored. Adding the common factors that we have found to those that were previously known and that can be regarded as belonging in the intellectual category, there are now some forty-seven intellectual primary abilities that may be recognized.

The Structure of Intellect

Recently we have given much thought to similarities and differences among these abilities with an attempt to see whether there are some general principles involved. Efforts to classify the factors have been moderately successful and certain principles seem to stand out. The result is what I have called a "structure of intellect" (1).

As a background for presenting this system of the intellectual factors, I might remind you of some general ideas that preceded it. E. L. Thorndike and his students one time made the general proposal that there are three kinds of intelligence - abstract intelligence, mechanical intelligence, and social intelligence (3). We actually obtained little help from these rational distinctions, but you will see later the extent to which our classification supports them and where it goes beyond them.

Another common present-day distinction is made between verbal and non-verbal tests or between verbal and quantitative tests, with the empirical finding that correlations between tests of the two classes are relatively low. What has not been sufficiently realized is that there are sometimes very low, even zero, correlations

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[1] Aptitudes of High-Level Personnel, under Contract N6onr-23810 between the Office of Naval Research, Personnel and Training Branch, and the University of Southern California.

among some verbal tests, as such, and also among many more non-verbal tests. Factor analysis enables us to account for these low and zero correlations. Where two tests correlate zero they have nothing whatever in common. They represent totally different factors.

It turned out that the known intellectual factors could be classified in three ways, all mutually compatible, which gives us three broad principles. I have already spoken of the recognized distinction between verbal and non-verbal tests. Factor analysis supports this distinction, as one should expect; there are verbal and non-verbal primary abilities. But there is a further differentiation, probably just as profound and important, among the non-verbal tests, which gives us three categories of abilities, depending upon the kinds of materials or contents with which the examinees have to deal.

Some abilities pertain to the use of what we have called "figural" material. The examinee must be acquainted with and use certain figural properties, such as shape, color, texture, size, and so on. This class of abilities might be called "concrete" intelligence. The objects to be dealt with, and their properties, are perceived. This group of abilities comes closest to what Thorndike called "mechanical" intelligence, and correlational studies have shown that a number of the abilities in this category do contribute to success in mechanical-type tasks or tests. There are a number of other abilities in this class, however, that probably have little importance for mechanical work, and all of them are undoubtedly of use in connection with certain non-mechanical activities, such as art in all forms and in thinking that involves concrete objects.

A second class of abilities pertains to the knowing and use of what we have called "symbolic" materials. The most common examples of symbolic material would be syllables, words, and numbers. In mentioning words here, we do not include word meanings; only the word structure is important - its combination of letters. Other structures of thought can be built up from numbers or even from simple figure units of other kinds, as in Chinese characters or in picture writing or in shorthand.

The most obvious field of intellectual activity in which symbolic abilities should be important is that of mathematics. One of our graduate students (2) found that conventional, verbal tests are of almost no value in predicting achievement in upper-division and graduate-school mathematics but that certain symbolic and figural tests did have some predictive value. Other subjects in which symbolic tests would probably be predictive are reading, spelling, and grammar. The structural aspects of language perhaps bring into this category also courses in literature and in foreign languages. I used to be mystified by a finding that a score for the ability to do numerical computations correlated substantially with grades in literature. The explanation may be their common dependence upon symbolic abilities.

The third category in terms of test material is featured by verbal tests in which word meanings must be known and used. We have called this the "conceptual" category but more recently have favored the term "semantic." Conventional,

verbal-intelligence tests are almost entirely restricted to this category, but they by no means sample all of it. The reason is that intelligence tests were originally designed to predict which children would progress successfully in school; and this depends first of all upon reading and secondly on ability to master arithmetic, which, apart from number computations, depends upon verbal abilities. This bias in favor of verbal abilities has probably had some unfortunate aspects, when we consider the whole range of both figural and symbolic abilities, which have been given relatively less attention in education. The verbally facile child has tended to be the "fair-haired boy" in education, and this tends to continue on through the upper levels of education.

In reference to the Thorndike types of intelligence, again, what shall we say concerning our symbolic and semantic categories? Both would seem to fit his broad concept of abstract intelligence, one being a verbal-abstract intelligence and the other a non-verbal abstract intelligence. We have found nothing thus far in our research that conforms to his concept of social intelligence, but I will tell you later where I think it fits into the picture.

The first basis for classification of the abilities, as we have just seen, is according to the materials of thought. The second basis pertains to the kind of functions or operations or processes involved. This basis gives us five classes of abilities. The first kind of operation is cognition. There are abilities to discover or to know and to rediscover or to recognize figural objects and their properties, symbolic objects, and meanings of all kinds. A second kind of operation is that of retention or memory. There are a number of memory abilities, paralleling the cognitive abilities, so far as we know them. A third class of operations involves what we call "convergent thinking". This is in contrast to a fourth class called "divergent thinking". A distinction between convergent thinking and divergent thinking was forced upon us by the way in which factors and tests group themselves. In both cases, the thinker must produce information from other information. In convergent-thinking tests, the examinee usually must arrive at one right answer. The information given generally is sufficiently structured so that there is only one right answer. The best example of this is a mathematical problem, but an example with verbal material would be: "What is the opposite of hard?"

In divergent thinking, the thinker must do much searching around, and often a number of answers will do or are wanted. If you ask the examinee to name all the things he can think of that are hard, also edible, also white, he has a whole class of things that might do. Where convergent-thinking abilities can be appropriately tested by means of multiple-choice tests, divergent-thinking abilities must usually be examined by open-end, multiple-completion tests. It is in the divergent-thinking category that we find the abilities that are most significant in creative thinking and invention.

Most of our problem solving in everyday life involves divergent thinking. Yet in our educational practices, we tend to emphasize teaching students how to find conventional answers. It is time that we give more attention to development of skills in divergent thinking and also that we show more tolerance of outcomes of divergent thinking. When the individual is later on his own and will have to depend upon his own resources, he will find that textbook answers do not solve all his problems.

The fifth category is that of evaluative abilities. The layman sometimes criticizes intelligence tests because they do not measure what he calls "common sense". Our findings indicate that there is much sense in such a criticism. There is a class of abilities that seem to involve decisions as to the goodness, suitability, adequacy, or success of our information, our memories, and our products of thought. Different kinds of criteria, logical and non-logical, are involved, a fact that gives rise to different evaluative abilities. Critical thinking and decision making come in this category. Efforts are often made to teach students how to think critically, and this is a worthy objective. Sometimes, however, I fear that this is overdone, at the expense of other aspects of thinking, at least. A too-critical atmosphere is one of the deadliest enemies of creative thinking of the divergent-thinking type. What we must aim for is a balance and a recognition that there is a place for development of all aspects of thinking skill, and each aspect should be given its proper place.

We finally come to the third major principle of classification of the intellectual abilities. This is in terms of the products of the operations. By applying various operations to the different kinds of materials, we arrive at certain kinds of products. In the area of cognition, we can discover or know elements; for example, figures, word structures, and meanings. We can become aware of classes of elements; of relations between elements; and of patterns of elements, that is, structures or systems. We also see extrapolations beyond the material given, in the form of implications and predictions. The last class entails a triad of foresight abilities; foresight in connection with concrete situations, in connection with symbolic material, and also in connection with meaningful ideas. Similar products pertain to the other major categories: memory, convergent-thinking, divergent-thinking, and evaluation. So far as we can see from the factors that are now known, there are extensive parallels in all these areas, so much so that it is possible to predict unknown factors and their properties from the known factors and their properties. There are vacant cells in the systematic tables of factors, each calling for a possible ability not yet discovered. Since the system was originally conceived, we have located or discovered seven factors that seem to fulfill the requirements for places in the system.

It is time to return to the question regarding social intelligence. There is currently under way at different places research on what is now called "empathy" or "empathic ability". This is defined as an ability to understand other individuals, and hence is probably conceptually equivalent to Thorndike's idea of social intelligence. From what we already know about intelligence, it is natural to predict that there are a number of abilities involved in the understanding of other individuals, their perceptions, their thoughts, their feelings, and their intentions. From the structure of intellect as presently conceived, we may expect that these abilities should constitute a fourth class of abilities to deal with social, or psychological, or behavioral material. If so, there would be cognitive abilities of this kind pertaining to the understanding of the behavior of others. There would be memory abilities for remembering behavior; and there would be productive-thinking abilities, and evaluative abilities, the latter being involved in the judgment of behavior in one way or another. This line of thinking suggests a whole new way of going about the investigation of

this old and baffling field. I think we are going to have to use quite different types of tests than we have tried thus far in this area.

Figure 1 is a graphic representation of the present theoretical conception of the structure of intellect. Because of the three modes of variation among the classes of abilities, it is possible to represent all the intellectual factors in a three-dimensional, cubic model. On the front face of the model, we have the cognitive abilities. The columns represent the four kinds of material - figural, symbolic, semantic, and behavioral. In successive tiers behind the cognitive layer are parallel ones for the memory, productive-thinking, and evaluation factors. Within each layer horizontally, we have kinds of products, which are assumed to be common to all columns and all tiers. The row categories for cognitive abilities - elements, classes, relations, systems, and implications - seem to have quite general application, although there are many logical problems still to be ironed out.

A single factor is thus at the intersection of three variables - kind of material, kind of operation on the material, and kind of product. As the model stands at present, the number of such intersections is 4x5x6, or a total of one hundred and twenty. One is tempted to say that there are one hundred and twenty ways of being intelligent. If all the primary abilities predicted by the model prove to be genuine, we shall have at least that many. The truth is that in some of the figural cells we have already found more than one factor; for example, there is an ability to cognize visual, figural elements and an ability to cognize auditory, figural elements in one cell, and two corresponding memory abilities in another cell. It is possible that the behavioral-content abilities will need to be subdivided into two complete sets - those pertaining to the behavior of others, and those pertaining to behavior of one's self.[2] From both of these sources, we should have additional numbers of factors.

Common Questions Concerning Factors

I shall now attempt to anticipate some questions that are often asked regarding factors. Are the factors independent or are they inter-related? That is, are they correlated in the population? The fact of common materials, operations, and products suggests interrelations. The fact that the primary abilities fit into series suggests that neighboring factors might be more strongly related than more remote ones. We have as yet no good procedure for estimating the degree of correlation between factors, as such. We are giving attention to this problem now. It can be predicted, however, that intercorrelations will depend upon the kind of population concerned.

Are the factors universal? That is, will they be found in all races, at all ages, and in both sexes? We can say almost certainly not. Our results, and others of similar character, have been obtained in populations of young men of better-than-average IQ. Young children, and even lower animals, have exhibited the presence of some of the figural factors. We do not expect much in the way of evidence of verbal abilities

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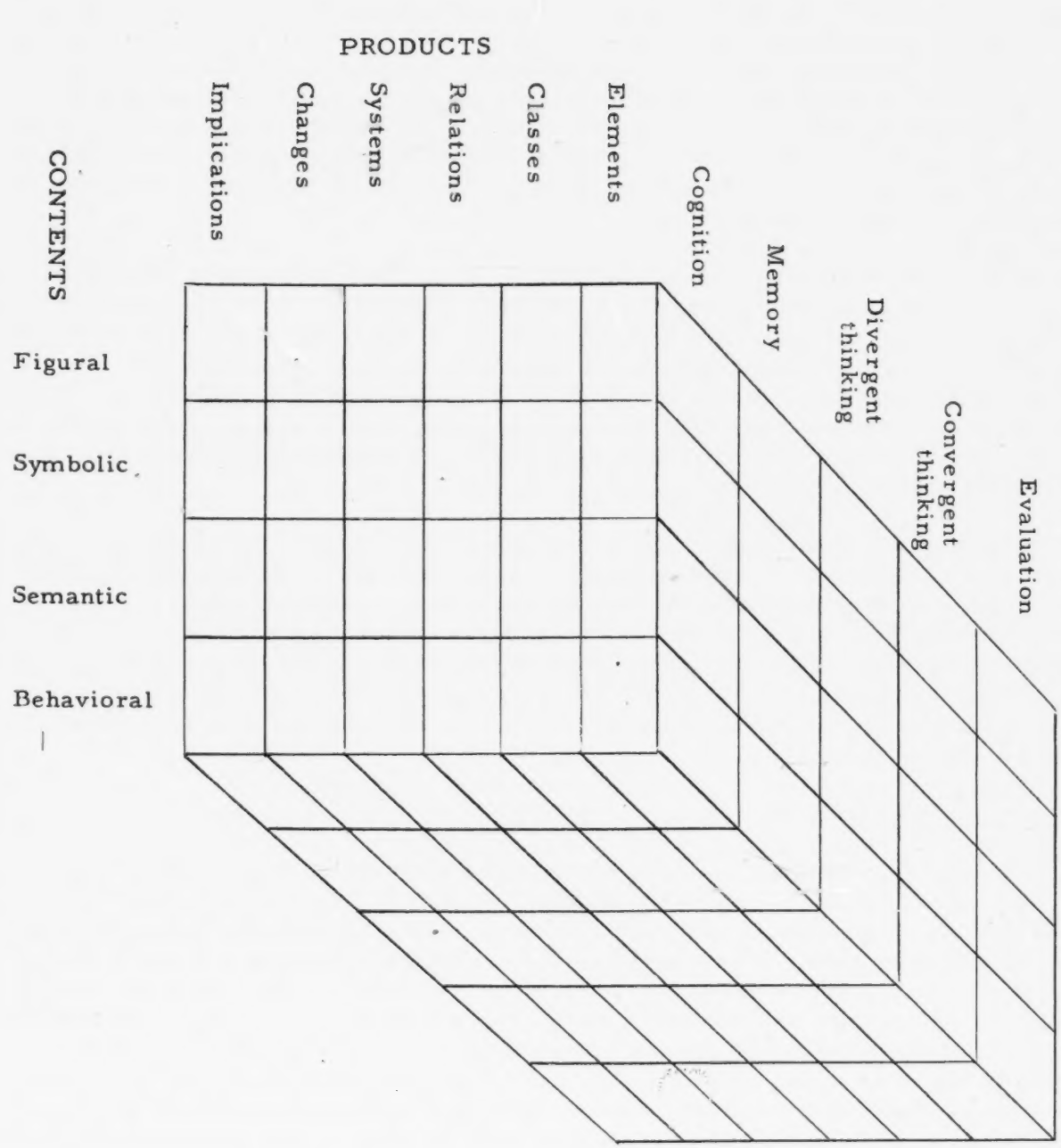
[2] I am indebted to Mr. Philip R. Merrifield for this suggestion.



Theoretical model for the complete "structure of intellect."

Figure 1

until children learn to use the language. The symbolic abilities probably come into the picture a bit later. If there are social-intelligence factors, however, at least some of them probably appear even earlier than the semantic ones.

Our old friend, the question of heredity vs. environment, always comes up. Here we can only guess. It is my hypothesis that the foundations are laid for all the factors by virtue of heredity, more fully in some cases than in others. I would further hypothesize that all of them can be affected more or less by learning, formal and informal. There is some evidence that this is so. It would seem that we are in a much better position to investigate the relation of intelligence to heredity and to environment than ever before. We should also be in a much better position to promote development of the abilities. Knowing what kind of thing they are, we have a much better idea of the objectives toward which to aim education in order to improve the abilities.

Are all these different abilities important? To a scientist they are all important. In the practices in which tests are used, some are obviously more important than others. It is sometimes asked whether, if two of the factors have done so well in predicting academic achievement, can any other factors add much more. In general we do not know, because not many of these new factors have been studied in relation to achievement. They are likely to make their greatest contributions at the high-school and college levels, and in the specializations particularly of professional-school education.

Are the intellectual abilities the only sources of success? Obviously not. There are also sensory and perceptual abilities and there are psychomotor abilities, all of which may play their roles in various endeavors. There are also traits of temperament and of motivation that can make their contributions. A minimum of motivation is of course essential, and outstanding levels of motivation often make individuals stand out. It may be of incidental interest to you that we are finding some factors of interest that parallel logically some factors of ability, especially in the area of thinking.

Some Implications

It will take considerable time and effort to work out all the implications of a multiple-ability conception of intelligence. One implication that has not been sufficiently recognized is that each person may be rather uneven in his many aspects of intelligence. Where there is low correlation among the factors, this is quite possible. Every one has a chance to excel in one or more aspects; every one has a chance to be deficient in one or more aspects. Perhaps one reason we do not notice as much unevenness as exists is that in common performances a person can often cover a weakness by having other strengths. Some weaknesses cannot be easily compensated for, however, and so we find intelligent non-readers, non-spellers, and non-writers, and the like. The diagnosis of particular deficiencies should be clearer in terms of the factors of intellect.

When we face the problems of educational and vocational guidance, the implication of the multiple-aptitude conception of personality should be obvious. If we

are to advise a youngster to go in the direction of his stronger aspects and to avoid the direction of his weaknesses, we must know as clearly as possible what those stronger and weaker aspects are. We need much more analytical information than is provided by an IQ or even by a half-dozen different scores. If the phenomenon of compensations that I spoke of takes some of the edge off of this need, we should learn where and when such compensations can occur.

It was suggested above that a knowledge of the intellectual factors and their properties should give us better ideas of how to educate for increased intelligence. This is true with regard to curriculum construction and also with regard to teaching procedures. We have often set for ourselves the task of teaching students how to think. Knowing the kinds of thinking operations there are, we can find the subject matter that should involve those operations; and we should know how to induce exercise of them in the student.

I began this whole discussion by reference to the age of space and of flights into space. I trust that with the presentation of this new and rather complicated view of human intellect, some of you will not think that I, too, have taken off into space. I assure you that I have tried to keep my feet on the ground and that in our aptitudes project we have made and are making a number of validation studies that are testing the relations of the new concepts to certain everyday operations. There has been no time to mention any of these studies. I can only say that the results indicate that we have not left the earth's gravitational field. We should be only too happy to feel that we have helped to increase the respect for human intellect and to build a conception that is more fitting for the time in which we live.

References

(1) Guilford, J. P. "A revised structure of intellect." Rep. Psychol. Lab., No. 19. Los Angeles: University of Southern California, 1957.

(2) Hills, J. R. 'The relationship between certain factor-analyzed abilities and success in college mathematics." Rep. Psychol. Lab., No. 16. Los Angeles: University of Southern California, 1955.

(3) Thorndike, E. L. et al. The Measurement of Intelligence. New York: Teachers College, Columbia University, 1926.

GLENN C. MARTIN (Counselor, Santa Monica City College, Santa Monica, California): I would like to ask Dr. Guilford if his model of the structure of intelligence is available in the literature.

DR. GUILFORD: No, the model is not. I had an article on the structure of intellect in the Psychological Bulletin in the summer of 1956. That was the

only thing in the journals.

JOHN CAFFREY (Director of Research, Palo Alto Unified School District, Palo Alto, California): Those of us who have to select children for, let's say, a gifted child program and who are using simple material such as the total IQ on a general intelligence test feel embarrassed, I think, when we try to imagine a 120-cell profile as a basis for selection. I wonder if there is any potential value in taking this multidimensional view regarding a gifted child as one who has high scores in a number of these areas and taking this as an operational definition rather than posing as a specific criterion a specific score for a specific area.

DR. GUILFORD: Well, it all depends on what you want in the way of the gifted child you want to select. Do you want him to be superior in certain ones of these abilities? If that is true, then you will test him on these fields that you have selected. I think that beyond the selection for general readiness to learn school material, which is based mostly upon the fact of verbal comprehension and next upon general reasoning, these others would add information about specialized directions.

MR. CAFFREY: Doesn't this imply a highly differential curriculum, and not a gifted child program?

DR. GUILFORD: Yes. If you took all the factors, it would have reference to all kinds of curricula.

JACK W. WILLIAMS (Head Counselor, Arroyo High School, El Monte, California): I was wondering if Dr. Guilford might be able to mention any type of technique that would help, in this productive thinking, to pick out the factors of this divergent-thinking that you mentioned, the creative type of thinking.

DR. GUILFORD: Yes. As I said, the divergent-thinking types of abilities will have to be tested, as far as our experience shows now, by means of completion tests - open-end tests. You can't do testing by means of the multiple choice tests when you are testing for originality, for fluency of ideas, for flexibility of thinking, and so on. You have to use open-end material. That kind of test is not used now for selecting students or children in terms of aptitude.

MR. WILLIAMS: I have one further question. We haven't quantified that type of material in test standards?

DR. GUILFORD: That's right.

DEAN CARLETON (Director of Instruction, Colton School District, Colton, California): In regard to completion questions, I am interested in the mechanization of processing the responses that you get. Is there any way such as there is now with the multiple choice of measuring by machine if it is an open-end question?

DR. GUILFORD: As I understood your question, it was whether or not such open-end tests can be adapted to machine scoring. I do not know of any way of doing

that. I would add to the response that I gave a moment ago that we found some of our multiple choice tests actually had small negative relationships to the factor of originality.

JAMES M. HARRIS (Assistant Professor, Brigham Young University, Provo, Utah): I believe I heard you correctly, but maybe I didn't. I believe I heard you say that all these factors are susceptible to learning and can be improved. I think this is different from what many of us have believed in terms of the usual IQ tests. I wonder if you could elaborate on this thing just a little bit more.

DR. GUILFORD: This is only a prediction. There is very little experimental evidence to support it. There have been a few studies, some by Thorndike and his students, some by Hartson at Oberlin, and a few others, aimed at determining whether different kinds of course instruction would bring about improvement in parallel or comparable lines of ability in terms of factors. In general, the results do point in this direction. This is all that I know about the subject, but I have faith that many others can be developed by the right kind of training.

MELVIN ANGELL (Test Counselor, Fresno State College, Fresno, California): I am inferring that by combining those factors that you suggested here in relation to subject areas in which you would assume they would have relationships (perhaps adding temperament, motivation, and so on) that this would improve prediction. I am concerned, of course, that we always use an academic prediction - grades. I wonder how we are going to get around the magnitude of the reliability coefficient of college grades.

DR. GUILFORD: Grades as used for a means of selection or prediction?

MR. ANGELL: Yes. We seem to be forced to use grades as our criterion.

DR. GUILFORD: Oh, for evaluating the scholastic aptitude tests. I think that for many of these you are going to have to find other criteria than grades. In John Hill's study of prediction of mathematical achievement, the tests of originality tended to have slight negative correlations with grades; but in one graduate class where they stressed originality and evaluated it for us, there was positive prediction on this criterion.

EDWARD FRY (Director of Reading Clinic, Loyola University, Los Angeles, California): I wonder if Dr. Guilford has any weights assigned to these various categories - for example, divergent-thinking, cognition, and so on. Is any one more important, or would you give each one the same value?

DR. GUILFORD: We have done nothing in the way of arriving at a decision about weighting these. The weight would depend upon your purposes and what you would use the factors for. This depends upon a lot of research.

ERNEST H. BERG (Counselor, Santa Barbara Junior College, Santa Barbara, California): I wonder if Dr. Guilford would comment on what factors are comprised in the old Spearman concept of G.

DR. GUILFORD: Well, from the way Spearman defined his G in his theory of cognition, I would say that the heaviest weight would go to the factors we call eduction of relations, relations between concrete material, between symbolic material, semantic material (and possibly psychological or behavioral material, when that is investigated). Discovering relations seems to be the main component of his G, also using relations to arrive at conclusions, the eduction of correlates.

HARRY L. STEIN (Acting Director, Secondary Teacher Education, and Supervisor, Graduate Studies in Education, University of British Columbia, Vancouver, British Columbia, Canada): Much of what Dr. Guilford has found boils down to the fact (and I think it is a fact) that it is practically impossible as far as we know to measure creative thinking through the medium of thought which has already been created. I wonder if Dr. Guilford would like to hazard a guess as to the possibilities of the use of projective techniques in the area of creative thinking.

DR. GUILFORD: Well, that is a poor question to ask me, because I have a little bias against projective tests in general. I think that what can be done with projective tests can be done better with psychometric procedures, perhaps borrowing from projective techniques the projective principle. I do not think that current projective tests are successful for indicating creativity. For example, Ann Rowe in her study of top scientists and artists found no prediction whatever from the Rorschach as to their creativity.

WILLARD HARLEY (Director of Counseling and Testing, Westmont College, Santa Barbara, California): You spoke of the fact that we should not encourage critical thinking too strongly. Would you elaborate on that?

DR. GUILFORD: My comment was that we shouldn't overdo it. It puts a damper on productive thinking or creative thinking. I said it has a place as a worthy objective, but let's be reasonable about how strongly we apply it in comparison with the encouragement of other types of thinking.

(The morning meeting was recessed at 12:00 o'clock noon.)

AFTERNOON SESSION

The conference re-convened at 1:45 p. m., with Dr. Michael presiding.

CHAIRMAN MICHAEL: Last week in San Francisco, when I was attending the annual meetings of the California Educational Research Association held in conjunction with those of the American Educational Research Association, I had the pleasure of having lunch with John Gowan, who was sitting on my right. I also have had lunch with him today, and again he is sitting on my right. It is probably a good omen. He said a great many things about the testing of gifted children with which I heartily agreed. I couldn't find anything with which I disagreed, and perhaps that is one reason I liked him so much. Before John addresses us, I should like to tell you a little bit about him.

John Gowan is a person of broad background. Having taken his undergraduate major in mathematics at Harvard, he taught both in private and public schools. Having studied and been quite active in research at U. C. L. A., he is certainly well qualified to speak on the topic assigned to him today. In addition to his extensive experience in the field of education, he has published a substantial amount of work in the general area of the gifted child. At the present time, he is serving as Associate Professor of Education at the Northridge Campus of Los Angeles State College. It is with a great deal of pleasure that I introduce to you Dr. John Gowan, who will talk on "Identification of Academically Talented Pupils in the Discovery and Development of Human Talent".

IDENTIFICATION OF ACADEMICALLY TALENTED PUPILS IN THE DISCOVERY AND DEVELOPMENT OF HUMAN TALENT

JOHN GOWAN

I must get one plug in. After July 1, 1958, it will be the San Fernando Valley State College.

The Educational Testing Service people, for reasons of their own, got the speakers over here last night for a "loosening up session". In order that there might not be too much loosening up, they also asked us to submit the text of our speeches. Well, I wasn't able to get over here, although I would have enjoyed it very much. If my speech is a little unloosened or I am not loosened up enough, I think you will understand.

There are seven significant questions which we shall attempt to discuss this afternoon. The first question is "Why is the problem of identification of high level personnel such a crucial issue for our culture?" Second, "In what way is academic talent as we find it in the schools related to later life productivity?" The third question is "What are the definitions, objectives, principles, and value systems involved in the identification of academic talent?" Fourth, "When is the best time to identify academic talent, and with what instruments?"

Fifth, "In what population areas is the talent wastage greatest, and at what developmental levels is it most likely to occur?" Sixth, "What do we do once we identify academic talent?" Last, "What are the over-all implications of this problem for educators and the public?"

Two of the greatest thinkers the world has ever known, Socrates and Bacon, have used the allegory of the cave to illustrate the wonder, strangeness, and lack of perception that people would find in vastly changed social circumstances. These two great thinkers who lived centuries apart pointed out the fact that when we emerge into a new era, we are for a long time blind to the realities and implications of this transition period.

I would like to suggest that we are in a similar transition period today. As we stand on the threshold of the atomic and space age, we have absolutely no conception of the magnitude of the problems, the tremendous range of the frontiers and the opportunities, or the vast way in which all these factors are going to affect our lives, our education, and everything which we have had in the past. If you think that automobiles, telephones, refrigerators, and televisions have changed our way of life in the past, how much more will future inventions revolutionize it? We stand, therefore, at the door of the future; but we are trying to explore by applying the attitudes, the equipment, and the methods of the past.

Let us make some contrasts here and see how great these divergencies are. In the past, we could assume that progress would occur as the result of fortuitous circumstance. Now we are beginning to see that we must plan for progress. In the past, we could assume that there would be enough scientific, technical, social, and political leaders for all of our needs. Because the frontier today is everywhere, we can no longer assume that this fact is true. In the past, we could assume that we in this country were safe from attack behind two oceans. Now we know we are exposed to the most deadly military peril the world has ever known. In the past, we could depend upon our vast supply of raw natural resources. Now we must depend upon our most precious natural resource, and that is in short supply. That resource is brains and talent. In the past, we could afford to waste this talent. We can now see that as the industrial revolution approaches the climax state of automation, we need more and more of our people in the professional, technical, and service-worker class. We need fewer and fewer unskilled workers.

In the past, there was no theoretical limit to the productivity of a country. Now we are beginning to realize that the percentage of trained personnel in a country will put an absolute limit on the level of its economic and cultural development. In the past, we were creatures of nature. Now, for the first time, we hold absolutely our destiny in our own hands. Despite many warnings to the contrary, we have never really faced up to a planned manpower control of any kind in this country.

Almost half of our top 30% of talented students either do not get into college or fail otherwise to reach their true potential once they do get into college. On this slender remainder rest most of the creative discoveries and advances which we wish to make. We cannot increase the supply of talent short of eugenic breeding,

but we can do something about identifying and salvaging the ones who now get lost along the way or who are never really challenged by our society to reach their full productive capacity.

Let us look at our present state in this century. We live in a century which has seen the demand for professional personnel double in every single decade. We are now faced with a shortage of trained professional talent in almost every field of endeavor - in science, teaching, religion, and now even in business. Education has and will have a tremendous problem of retraining and upgrading through increased achievement a larger and larger proportion of the trainable talent of this country.

We live in a period which has been very fortunate in borrowing the brains of European scientists and thinkers who were refugees from tyranny and fascism abroad. We cannot expect that this bonus will continue. We must develop indigenous talent and use it fully.

We are entering a decade where, due to the low birth rate of the thirties and the high birth rate of the post-war years, we shall be supporting in the next ten years a population in the under-25 age bracket which will have increased some sixty per cent over 1945; and we will also be supporting a population in the over-65 age bracket which has increased by at least the same amount. We are going to try to do this with a labor force in the 25-year-old to 65-year-old bracket which will have increased only twenty per cent. We must either become more productive or lower our living standards as a result.

Finally, we live in a year in which we have been brought face to face with the full implications of Russian scientific and technical achievements. At stake in this race is our survival itself.

Society, which for a long time has been deaf to the plea of doing something for the able person for his own sake, must now do something for him for its own sake.

History and archaeology show us that the earth is full of ruins of civilizations which reached high levels of culture, but which were found wanting in meeting new challenges. Our challenge in this age at this time is to identify, train, make productive, and reward the talented people in our culture; for they alone can lead us in a safe pathway through the door of the future.

Our second question is "In what way is academic talent related to later life productivity?" You will note that the key word here is productivity. It is probable that most of the scientific and cultural achievements of our civilization are made by a relatively small number of persons who, in the phrase of Arnold Toynbee, form the "creative minority". The central problem of all civilization, as Toynbee has pointed out, has been that of stimulation of the creative energies of this group so that they will continue to respond to the challenges of the environment with creative and new adaptations of response rather than simply to ossify into a protective organizational structure.

In the past, we have assumed that this segment of our society was, first, adequate in numbers to face the challenge, and second, sufficiently mobile to perpetuate itself. In the day of broadening frontiers, we cannot be sure of either of these assumptions. We need to ask ourselves, "Who are these people? Where do they come from? Do we need more of them?"

It may be helpful to cite three experts to throw some light on this problem. First, let me quote Dr. Henry Chauncey, President of the Educational Testing Service, who was speaking at the National Education Association Invitational Conference on Academically Talented Students that took place in Washington in February of this year. He was speaking on the correlation between the Scholastic Aptitude Test at college entrance and frequencies of inclusion in "Who's Who" of the same people a quarter of a century later. His figures showed that there was a very close linear relationship, so that if an individual whose Scholastic Aptitude Test score would have placed him in the Army General Classification Test range of 110-119 were given a relative frequency of one, those whose SAT scores placed them in the 120-129 range in the AGCT would have a frequency of two and a half; those in the 130-139 range, a frequency of four; those in the 140-149 range, a frequency of seven; and those over 150, a frequency of fourteen. In other words, these people with Scholastic Aptitude Test scores in the highest bracket were fourteen times more likely to appear in "Who's Who" than their less fortunate brothers. This is a pretty clear indication that later life achievement is somehow associated with scholastic ability.

A second piece of research was presented last Saturday by Professor Jones at the California Growth Study meetings in San Francisco. He was reporting the relationship of high school achievement to adult achievement eighteen years later. The total high school achievement was found to correlate 0.48 with occupational status and 0.76 with cultural status even after this length of time. Jones concluded from his data that the upper middle class is recruited and maintained through ability rather than through social status factors.

A third study with which many of you are familiar, I am sure, was done by Knapp and Goodrich on the origins of American scientists. They found that these people were most likely to originate in small private liberal arts colleges where there were high achievement standards and close contact with the faculty.

There have been a number of other studies relating school achievement at various stages with later life productivity, and their import is always the same. Whatever it is that fosters greater achievement in careers, it is best measured, best tested, best refined and developed in school achievement. The only exception to this generality is that school achievement (especially for boys in high school) sometimes involves too much conformity to measure the full range of creative endowment. The evidence is plain, as Dr. Harrison Gough has concluded in a study of achievement in able students: "To achieve is a social response, and not to achieve is an asocial response." Achievement in school and college is one of the best measures we have of potential achievement later on in life.

Now it only remains to point out the values and uses of testing at earlier ages in measuring and predicting this achievement. Concerning this, Dr. Chauncey has

pointed out that "while there is no evidence that present tests of developed ability such as the Scholastic Aptitude Test measure creativity, originality, or inventiveness, correlations between the Scholastic Aptitude Test at ages 14 and 18 on the same people are so high that we could almost equally well predict college performance at the beginning, rather than at the end of secondary school." The correlation between the SAT scores and college achievement is also substantial, so that out of the top fifth on the SAT, 45% will do honor work in college, 52% will pass, and 3% will fail. On the bottom fifth, these percentages are exactly reversed. The chance is fifteen to one that the student in college will perform in the same extreme in which he did on the SAT. The same factors, evidently, which influence tests also influence academic achievement. The handicap of a poor background which affects a SAT test will also equally affect college achievement. If a lazy boy from a high socio-economic class and a hard-working boy from a lower socio-economic class both took the SAT and got the same score, you might wonder if they would achieve comparably in college. The evidence is that they would. Tests and marks together will predict college success better than either alone, and tests also have the advantage of being unaffected by disciplinary factors or the incommensurability which results from grades in different schools.

My third question is "What are the definitions, objectives, principles, and values involved in the identification of academic talent?" Now, before it is possible to identify academically talented children, we have to understand what we mean by this term. At various times, a child who could be described as a genius, a talented child in music, a child of high socio-economic status, or one who shows superior achievement have all been grouped in this classification. We will employ the definition adopted at the recent NEA Invitational Conference on the Education of Academically Talented Students and define these youngsters as those whose academic aptitudes as measured by tests of developed ability are one or more standard deviations upwards from the mean of all school children. Roughly, this represents the top sixteen per cent of the student population of this country - approximately those students with a Stanford-Binet IQ of 117 or over. We are thus describing a somewhat wider sample of the population than is usually referred to by the phrase "gifted children". By this latter phrase is meant, according to the definition adopted by the American Psychological Association, a child whose mental growth is increasing at a rate of 1.4 or more of the average maturation rate. At the level of IQ 140, we are sampling something less than one per cent of the general population.

To be even more precise, we shall define academic talent as closely related, at least at the earlier ages, to Spearman's G factor of intelligence -presumably that part which is measured best by the Stanford-Binet. We shall understand that in young children, at least, this talent is closely related to achievement in verbal and in quantitative skills and that, as youth mature, it may broaden out to include spatial, mechanical, and other intellective factors for which Professor Guilford has now devised a virtual periodic table. We shall frankly recognize that at later stages, this constellation of factors is easiest measured through tests of developed ability in which effects of achievement motivation and other environmental aspects contaminate the original aptitudes.

You will notice that this definition (which I am sure will please no one fully, but which I hope may partially satisfy everybody) is an eclectic one in that it tries to blur various theoretical differences about the nature of intelligence and achievement and their relationships to each other; but it is also a rather narrow one in that it rules out those special talents which sometimes achieve fame or notoriety in our culture, such as high aptitude in music or art, in entertainment, social skills, in physical coordination such as football playing, in cosmetic excellence such as that of a movie actress, or in special kinds of manual dexterity such as safecracking.

Now let's talk about principles. It may be helpful to state some principles which will serve as guide lines for later identification procedures. It is first important that identification should have a purpose and that some special activities for the child should result from it. The process of setting up a program of identification should grow out of the felt needs of the school or the district, and it should come out of exploration by the teacher of the best way to help academically talented students. Such a program is, in effect, an outcome of good guidance and faculty morale, rather than being the other way around. It should, of course, fit into a program for exceptional children and should operate harmoniously with the general program of education for all children. It should be flexible and subject to changes as needed. It should be integrated horizontally with respect to the child's relationship to other children and vertically with respect to an integrated program throughout the whole school life of the child. It should be wider than just a unidimensional check of the IQ; and it should involve such other factors as achievement, special abilities, social aspects, personality, motivation, originality, and creativity. Lastly, it should disturb the child as little as possible in his personal and social relationships. It should not result in self-consciousness, parental frictions, or untoward publicity.

Now let us try to enumerate some of the objectives of a program for the academically talented children. Since the education of talented children should form a harmonious unit in the program of general education for all children, it follows that the objectives for academically talented students should take their point of departure as corresponding evaluation procedures from the general program of education. The Educational Policies Committee framework of education for all American youth is representative of such a general pattern. It remains only, therefore, to modify this in such instances as pertain to significant functional differences between the academically talented and the generality.

These functional differences may be summarized as follows: Academically talented children are more intellectual. They are more versatile in their interests. They are capable of more concentration and more creative and original results. There is more discrepancy between social and emotional development and intellectual development. They are more able to tell us what they need, what they want, what they enjoy, and especially what they are annoyed with. They are potentially capable of greater social returns. A program for them will therefore depart from a general program in its increased emphasis in these areas.

A further consideration which we should face is to distinguish between what is

good in a program of special education for such children and what will be equally good for all children in an ideal situation. Frequently, some modification, such as small class size, is advocated for academically talented children. While this is undoubtedly a good idea, it is probably an equally good idea for children at any level of ability. The crucial question is, therefore, what are we doing for these children which could not or should not be done by any good teacher in any good regular classroom situation?

Applying these principles to the evaluation procedures, we therefore must consider the questions we ask in the light of special differential abilities involved. In this light, it is possible to draw up the following list of objectives. Here I am quoting from Norris and Terman in the Forty-Ninth Yearbook of the National Society for the Study of Education.

"1. To enable them to deal commonly with themselves, their fellows in the world;
2. To build a sound, liberal foundation to sustain a vigorous development of specialized competency at higher levels;
3. To foster self-direction, independence, and love of learning and the desire to create and experiment with ideas and things;
4. To provide the understanding, inner consistency, and ethical standards to see their own uniqueness in terms of responsibility to society;
5. To stimulate critical thinking and to develop a scientific approach in solving persistent problems;
6. To nurture an appreciation of cultural heritage bequeathed through the ages; and
7. To motivate the desire to meet the special expectations which society has for them."

Now these objectives differ from those of other children only in a relatively greater emphasis on creative effort, intellectual initiative, critical thinking, social adjustment, and responsibility and development of leadership qualities. Of paramount importance, however, is the need to assure these children the opportunity to achieve in academic areas. The under-achieving student who is able is one of our chief targets in this endeavor.

Lastly, in this area, we must talk about value judgments of society. We must do this because value judgments of society are affected by values in the public schools. If we are to attract more young people into scholarly fields, we must somehow change the attitudes and value systems of the public as to the rewards of intellectual productivity. William Graham Sumner once defined one aspect of democracy as a condition where there was easy social mobility. Education has always been the ladder for this climb in our culture. We need to preserve this avenue toward social productivity and prestige on the part of our able students.

Also, every community must make a value judgment as to the level at which it will operate its academically talented program. The place where the cut is

made will have a very considerable effect on the kind of program which is offered. Each community must also decide what kinds of public cooperation and support it will give its special programs. The excellent special programs for gifted students of the twenties, including the old Los Angeles Opportunity A Rooms, died on the vine in the thirties because of public apathy in the face of the depression retrenchment. Like the public, school administrators, guidance personnel, and classroom teachers must believe in the necessity of a strong educational background for academically talented students, or else public wishes are not going to be transformed into action. The kind of academic and scholastic morale which creates an atmosphere in which scholarship can flourish in school cannot be created without these feelings on the part of the community and the profession. The creation of this attitude of scholarship in our elementary and secondary schools is one of our greatest present needs. Its lack is one of our greatest present dangers.

Now let us turn to question 4, "When and how should we identify academically talented students?" One answer (and a quick one) is that we need early and continuous identification of academically talented students. We need it as early as the school is able to give special attention and training, and we need it continuously so as to pick up late bloomers, transfers, and other varieties of mavericks which may have been missed by earlier screens.

Ideally, this identification should begin at the school entrance, with relaxation of present state rules, so the intellectually able and socially developed gifted child may be allowed to enter early or to accelerate at once - especially if he is able to read easily.

Since it is impractical to give individual tests to large numbers of children, preliminary screening via a good group test which samples the area of verbal intelligence is advisable. A fairly high ceiling on such a screening device is very desirable, as I am sure you all know. Probably about twice as many children should be picked up by this test as will ultimately be retained by the individual test. It is important, however, that screening not be confined to a single test or the single concept of IQ.

Children who read before school entrance, who test two grades over placement, who ask many perceptive questions, who have well developed hobbies, who generalize easily, who show striking and original creativity, who have long attention spans - all of these children need to be checked. In general, the data should be evaluated in the manner of a clinical judgment, with all aspects of the child involved. No one should be included or excluded from such a program automatically. Identification is not a bookkeeping procedure. Care should be taken to see that three types of bright children are not missed. First are those with reading difficulties; second, those with emotional difficulties; and third, those from minority groups or bilingual backgrounds.

Immediate grouping and remedial work for these children may restore their achievement motivation which was otherwise very seriously blunted in the early years of elementary school.

Screening, of course, is best concentrated at the lowest appropriate grade level. Experience and an understanding of motivational factors involved indicates that the third grade is usually the best place to start this program. Special surveys, of course, should be set up to handle other problems later.

It should also be noted that instead of a cut point, there may be an area within which subjective judgments operate as to whether a child is or is not in a given program. Social, psychological, and physiological factors are involved here. Obviously, adjustments and changes may be made during a program. Adjustments will depend on funds and other factors. Re-evaluation will be necessary to determine if borderline cases should be reviewed for reversal of decisions. It is a very interesting fact that the better the identification processes become and the longer they are used in any one district, the higher the percentage of children identified.

Now question 5, "Where is the talent wastage greatest, and in what developmental stages is it most likely to atrophy?" Dr. Stouffer of Harvard has done some excellent research which provides a clear answer to this question of "In what population categories is the talent wastage greatest?". Stice's report has given us further clues in this area. From the results of these researches, we can say rather categorically that the talent wasted is greatest first in the lower socio-economic status brackets as opposed to upper, in girls as opposed to boys, and lastly in rural areas as opposed to urban areas.

Dr. Stouffer finds that lower class parents often do not hold the expectancy of college for their bright children, and that college-going is often more related to parents' expectancy than to actual ability on the part of the child. The school, therefore, needs thorough counseling to provide the atmosphere of expectancy needed to send bright students on to college. Secondly, we still stereotype jobs by sex. Dr. Conant has recently noted that we do not enlist enough bright girls in mathematics and the sciences. We need to change our attitudes in this area. Thirdly, we need to provide more utilization of opportunity through a federal scholarship program through matched state funds - especially for bright rural youth to go on to college and to otherwise enjoy the benefits of a good education.

Turning now to the question of the developmental state at which loss of motivation is most likely to occur, it appears that all ages of childhood are important, but two different levels are critical. The first of these levels occurs at the early part of the latency period when the child, in Erikson's phrase, is in the industry stage. At this time of life when he is in the second or third grade, he is also absorbed in the peer group relationships of early socialization. The trouble is that the able child at this level may neither be challenged to industry by the work in his heterogenous classroom, which is far too easy for him, nor is he able to find true peers among his age-mate friends. Thus he learns both habits of laziness and unsocialness at a time when he needs to be challenged on both issues.

The second problem comes mainly to lower socio-economic status boys near

the end of the latency period just before their maturation. These boys are usually facing increased opposition by their environments and often by their parents to scholastic achievement and the academic life generally. In addition, their rebellion against authority may well extend to the school and to its curriculum. Oftentimes a counselor at the seventh grade level decides not to send one of these on into the college preparatory courses because of the previously mentioned factors plus their parents' indifference. Later, if this boy decides to go on to college, there is usually too much ground to make up.

We need more counseling for the non-trouble-makers in junior high school. Much of the high school achievement that we have is won through conformity. Society and education need to find ways to keep the creative libido in children intact through the socialization process so that they, in Reisman's phrase, will grow up inner-oriented rather than other-directed.

Now, question 6, "What do we do once we have them identified?" Well, firstly, we need to take advantage of the psychological implications of the industry and socialization stages of the early latency period, and understand and exploit the achievement motivation that children have in each stage. This is an area that we do not yet fully understand and that we do not take full advantage of - especially in our bright children.

Secondly, someone has said that this is the age of guided missiles and unguided children. We need a real guidance program in schools for able children - not just a guidance program for retarded and disciplinary cases. This involves load reduction to realistic levels. By realistic levels, I mean down below 300.

Unless we are going to do something with the children after we identify them, there is not much use in the identification process.

Third, we need to employ special methods with the academically talented. It has been estimated that, whereas three-quarters of high school seniors get some kind of testing, less than 5% of our secondary schools have special programs for able students. We need a multitrack system involving the simultaneous and combined use of acceleration, enrichment, and grouping.

Fourth, we need procedures, rewards, publicity, and interest on the part of those in charge of education to make scholarship respectable and desirable again in our schools. The idea that high school is a loafing period where no one needs to work and one can get by on as few solids as possible during the senior year has simply got to go. In its place, we need to encourage the kind of interest and effort which comes when able students are brought together under an able, interested, and dedicated teacher. When talented students are let out of regular classrooms, it should be into a library or laboratory where they can work singly or in small groups. The curriculum for able students should well comprise from sixteen to twenty solids, with five solids a year instead of four, which might include the recommendations of the NEA Conference - four years of English and three or four years of mathematics, science, history, or foreign language. Along with these recommendations, new course content with a

view of integrating some of the old concepts of course structure would be very advisable; and it is now under way, as many of you know.

I would like to quote from a report made in connection with this in the guidance area, which says that "guidance in the deepest and broadest sense of the term is essential for adequate development of the talented student". The guidance process has many dimensions, all of which need restudy in terms of the specialty that is encountered. The importance of developing adequate cumulative records which touch upon any matter that might enable the teaching staff to better estimate the past, present, or future of any student is clear to all professional staff. This is particularly urgent because population mobility makes the communication of basic information difficult.

"Trained counselors who have the support of the administration and who are not tied to problems of discipline, delinquency, and maladjustment are essential. Increased staff to reduce the counselor-student ratio to manageable size so that a competent and professional counseling job can be done must also be provided. Counselors should work closely with teachers, students, and parents. Guidance services should be continually available. The academically talented youth has many choices to make, and he needs help in understanding the alternatives and seeing the possible consequences of his decisions." This is from the recommendations of the Guidance Section of the Conference on Academically Talented Youth.

Now, finally, what are the overall implications for educators and the public? First, value systems of the American public are unerringly reflected in the American public schools. We must therefore do something about changing the attitude of the public before we can redirect more young people into scholarly fields. I think Sputnik has been the greatest blessing this country has ever had in this regard.

Secondly, if we are interested in world leadership, we had better commence the practice of earmarking more dollars per capita for the able child than we now do for the retarded child. This also means some kind of federal subsidy to be given the education of able children.

Thirdly, an increase of two per cent, it has been estimated, in the school budget would make adequate provision for at least a start on a program for academically talented pupils. We need, in addition, public support, administrative foresight, and trained teachers.

Fourthly, if we continue to reward conformity in our culture, we are going to have a culture of conformists. Such a culture in the past has always gone down to defeat. We need to consider and to encourage special talents and interests, strength and persistence of motivation, ample energy, originality and creativity, and the personality factors which are associated with them, in transforming our gifted students into productive workers in our society.

Fifthly, the minimum essentials for a working program for academically

talented students in a given school district, according to Dr. Lyle Spencer, are as follows: (1) an influential public group ready with financial support, but not policy dictatorship; (2) local school boards who will appropriate money and stand behind the program; (3) a top administration official who is willing to become involved personally in the program; (4) a faculty member, preferably a guidance person, who will take charge and will handle identification through wise use of testing and who is enthusiastic and able in the handling of personnel relationships in the staff; (5) the involvement of the most able teachers through in-service and workshop programs; and (6) the indoctrination of students and parents to change values and attitudes toward the scholastic achievement motive.

Finally, our society needs to take careful stock and adopt good conservation procedures towards its most vital and scarce natural resource - brains and productivity. We must recognize that the percentage of productive people in our society places an absolute upper limit on our level of culture and of technical progress. We must use education as a tool to identify and bring as large as possible a number of these individuals to social fruition - not only for their own sake, but for our own survival.

Education and educators need somehow to meet the challenge of training and upgrading the talented without regard to race, sex, religion, class, or residence if we are to survive and prosper in the boundless frontiers of the opening atomic and space ages ahead. This concern is not a passing fad. As an increasingly serious social problem, the identification, training, and delivery of high level talent is destined to become the paramount educational issue of the twentieth century.

DAVID W. KEIRSEY (District Psychologist, Covina School District, Covina, California): You mentioned that you felt that parental expectancy had something to do with achievement. Would you elaborate on that a little bit?

DR. GOWAN: I am very much of the belief that bringing up a child to be an achiever is very much like learning how to bake cookies. You have to bake them so they will not be burned to a crisp, and yet you do not want to get raw dough either by not having any fire. I think that a steady kind of parental expectancy (I hate to use the word "pressure") for achievement on the part of the child is a very important aspect in this whole problem.

Some of the studies which McClelland of Harvard has done on achievment and the development of motivation are very basic in this area. In other words, the less a child perceives that he is going to gain approbation from the kind of things he does, the less he will be motivated. This is particularly true when he gets into this industry stage at the age of about seven or eight. Without this, I do not think that he ever will go through the effort which is required to handle quantitative and linguistic symbols in the way and to the degree we want.

There was a very interesting study by Barrett which was reported just recently in the Personnel and Guidance Journal in the Toronto Schools. Barrett's study clearly indicates that the nature of achievement in young children who are gifted has a very definite relationship to their personalities. There is another very

fine study by Haggard in the December, 1957, issue of the School Review. This indicates some other close relationships between achievement and personality in young children.

We are just beginning to open this subject up. I think that in the next few years we are going to know a great deal more about achievement and how it is fostered in young children.

MR. KEIRSEY: Your answer to me seemed you were saying that, when the parent places value on achievement, this seems to foster it. Is there some distinction between placing value on achievement and expecting it?

DR. GOWAN: I wouldn't want to try to distinguish between those two things. I think in the past we have been in a situation where we have tried to be very permissive. First we were very authoritarian; then we were very permissive. I think we need to realize now that a parent's attitude towards a child should be determined by the needs of the child, and these needs change at different times.

Where a parent doesn't have this expectancy for the child, the school somehow needs to provide the expectancy of his going on to college - especially for the bright child of a lower socio-economic status. This is where we are losing lots of them. Somehow, we must find ways to do this. The best way, of course, is to have an attitude of scholarship in the schools. This is one of the things we are missing out on at the present time.

SEYMOUR STEIN (Counseling Psychologist, Veterans Administration, Los Angeles, California): I would like to take exception to the implication that "Who's Who" represents all that is good, desirable, and gifted in our society. I think this presumption of an elite bothers me a little. We have talent wastage in our whole population. If we plead for a specialized program, we are really doing the same thing as failing to provide for individual differences that occur in our everyday type of program. Specialized programs that do not consider the needs of all students produce social organizations where the gifted have been crucified, excommunicated, disenfranchised, and all sorts of things. Isn't this, in a sense, a kind of taking an opportunity to use Sputnik to say, "Something is happening. We need our best." and sort of overlook what we need for all?

DR. GOWAN: Well, Seymour, I have difficulty in replying to this - partly because you and I have been buddies and have been arguing this on other planes.

I would certainly agree with you that "Who's Who" is not a measure of talent. It is one way that is easily available. I was simply trying to report that there does seem to be some relationship here. Obviously, I think you can get into "Who's Who" more by conformity than by perhaps other ways. I was simply trying to establish the fact that there is some relation between academic achievement and later life success, no matter how you may wish to measure it. Obviously, there are a number of people for whom this is not true.

With regard to this other question, I think that we are in a position today that

we want to have education for everyone. I would certainly agree with you that this is a fine idea. I subscribe to it completely. I again feel that education for everyone means equality of opportunity. It does not mean the same amount of education for everybody. I cannot agree with some who say this means a college education for everybody. Those of us who have worked in the schools know there are a lot of kids who are seventeen and a half years old in high school who are just waiting so they can get out of high school. They are essentially prisoners.

Now it seems to me that this isn't just a matter of what we are going to do for the kids any more. I think the answer is that society must do something for its own sake. Society has to decide who has the brains to help make some pretty important decisions. It seems to me that the only answer we can find to this is in terms of people who are more likely to do it. I agree with you that there may well be some people who haven't had education who will be able to do this. I think, by and large, as a statistical procedure, we are going to find that more people who have come up through this thing are going to be able to do it. If we are fishing in pools, these are the pools to look for the fish in.

I don't think this is a matter of saying, "We'd like to do everything." I think it is a matter of saying, "This is a situation where we are in a boat, and you use the people in the boat who are best able to get you to shore." I think there is some urgency in the problem. I don't think we quite realize how much urgency there is. It isn't just the urgency of the Russians. It is the urgency of many other factors involved in our civilization. Even if we do not want to take cognizance of it, I am sure it will be forced upon us.

CHAIRMAN MICHAEL: Our second speaker this afternoon, John Dobbin, who represents the Princeton Office of the Educational Testing Service, is Director of the Cooperative Test Division in Princeton. Many of you who have had occasion to use ability and achievement tests at the secondary, junior high, and elementary levels are acquainted with this Division. John Dobbin is a person of diversified background both in education and work experience. He served as Chief Editor for the Educational Test Bureau from 1944 to 1948. After that, he was a research fellow at the Bureau of Educational Research at the University of Minnesota until 1950, at which time he joined Educational Testing Service as Project Director for the College Board program. As I said a moment ago, he is currently the Director of the Cooperative Test Division of Educational Testing Service.

John Dobbin will talk to us about "Tests Used to Improve the Quality of Instruction in the Development of Human Talent". It is with a great deal of pleasure that I introduce to you John Dobbin.

TESTS USED TO IMPROVE THE QUALITY OF INSTRUCTION IN THE DEVELOPMENT OF HUMAN TALENT

JOHN DOBBIN

Dr. Michael, Dr. Gowan, Ladies and Gentlemen: I bring greetings to you from the Princeton branch of E. T. S. It is my pleasure to express our gratitude for your

coming to this meeting - and our hope that you will find the day profitable.

A look at the title of my paper leads me to think that the decent thing to do is to give it a subtitle in English. I now prefer to call it, "Teachers Can Use Tests If We Will Let Them." I have a single and rather simple theme. It is related to the general theme of this Conference because teachers, in much larger numbers than specialists, are involved in the identification and development of human talent.

Less than a month ago, an eminent colleague of mine, who addressed this very meeting last year, climbed upon a rostrum in St. Louis and opened his remarks to a professional group with these words: "If you want to get some cheap applause these days from a mixed company of educators, all you have to say is that it's time we took the mystery out of measurement." These, to me, are fighting words - particularly since taking the mystery out of measurement is exactly what I have been preaching myself for years with little applause of any kind. They tempt me to take some liberties. Would they not fall as pleasingly on the ear if they went thus? If you want to earn a standing ovation these days from an audience of testing specialists, all you have to say is that testing is beset with a thousand complexities and amateurs had better leave it alone.

On the one hand is the opinion that measurement techniques and instruments should be used only by those who know a great deal about them. On the other hand is the opinion that practically any sensible person can do almost anything in measurement if the hocus-pocus of the technician is removed. Neither of these positions is tenable for long enough even to state it fully. It is from a position between these two false doctrines that I draw my text for today and begin my mission for the true gospel.

It is not necessary - nor even good manners in the company of the brotherhood - to dwell more than briefly upon the idiosyncrasies of the testing psychologist. We are a peculiar schizophrenic tribe. We are painfully aware of the tentative nature of our conclusions, yet we huckster them to unsuspecting clients as if they were as firm and finite as gumballs. Witness the years of scholarship and toilsome research that have gone into measures of vocational interest so that young Ph. D. 's can tell a high school student, "Your profile means that you ought to be an engineer." We struggle through difficult courses in statistics and read learned papers on the estimation of error variance, then tell a sixth grader dolefully that his achievement is four-tenths of a year below his ability level and he should do something about it. We devise a fine and sensitive instrument for the estimation of a particular human talent, then encourage its use for estimating almost any talent that is human. We may not be schizophrenic after all. We may be just plain shysters.

Let's look for a moment at those poor deluded souls we call our clients. They are, for the most part, earnest, hardworking counselors and teachers. Their only sin (at least in this field) is that they have not taken the time to specialize in testing by taking a miscellany of statistical and clinical courses in graduate school. If they are to use tests in their teaching and counseling work (and,

of course, we have helped to make it fashionable to use tests) they must depend upon us as specialists to tell them what test performance means in their circumstance.

Do we tell them? No. We tell them what a given test means in our circumstance, where there is no single test performance, but only a great many test performances, all neatly added, divided, sigmaed, co-varianced, normed, expectancied, and converted to decimal equivalents. We are so preoccupied with our group statistics, or so eager to demonstrate our erudition, that we almost never allow a client to know what a single test score really means in his circumstances.

The consequence? Well, it is a bitter one, and it is plaguing us now. We have taught millions of teachers to interpret a child's performance on an intelligence test as a point on a three-digit IQ scale. A child in two successive years, for example, earns IQ scores fifteen points apart. Maybe this fifteen-point spread straddles one of the artificial division lines we encounter in education, such as "120 and over is college material", and the teacher with her firm faith in the precision of the IQ values concludes that the test is no good.

Also, we have taught millions of teachers to interpret a child's performance on achievement tests as a point on a grade equivalent or a percentile scale. In the teachers' view, a test says that little Oswald is a 6.7-grader or a 56th percentile-grader in reading just as surely and accurately as other measurements say he is six feet four inches tall and wears shoes as big as his father's. Furthermore, we have taught the teachers to believe that Oswald is really different in reading accomplishment from Albert, whose test grade indicates that he is a 6.4-grader or a 52nd percentile-grader. When, on another test, their order is reversed (that is, Oswald's and Albert's), the deluded teacher loses faith in measurement.

A final tableau in our chamber of horrors. We specialists make a great to-do about norms. We strain to add more students, more schools, more cities, more states to our norming sample. The new possibilities of interplanetary sampling have some publishers on the brink of collapse. To do this, in order to compare individual youngsters with a more representative average student, amounts to a search for a more average average than anyone else has.

The truth of the matter is, of course, that the average student in our so-called national norms is already so very average that he doesn't exist at all. So we encourage the teacher to find out if Josephine is above the norm (and be glad that she is) or below the norm (oh, woe). Do you know that you are one and three-fourths pounds heavier than the average man? Do you know how heavy the average man is? Could it matter less?

Despite what I have just said, I am terribly proud of my field of work, educational measurement, and brag on it whenever I can. We are neither schizophrenics nor shysters. Hundreds of our colleagues are engaged in solid scholarship and produce sound research. Thousands of us are diligent scientists in the better sense of the word. The best of our work has not yet attained the level of respected science. But if it hasn't, it will in time, I am sure, because the

methods we use are scientific.

Our problem - the problem that makes us look like shysters - lies in the application of what we know about measurement to the millions of individual questions for which measurement can supply some answers. This problem (one for which I have given several examples) grows out of our errors of omission. We have used a variety of technical methods in our own study of behavior, in our own reduction of mass data, in our own development of test material. These methods are scientific, for the most part, and require a good deal of training to use. Yet when our product, the test, is ready for application to educational problems, we turn it over to untrained people and force them to use our whole elaborate technical paraphernalia if they are going to interpret it.

As a result, good tests by the millions are overinterpreted, poorly interpreted, dangerously interpreted, or interpreted not all in schools each year because their users are not trained in the highly technical skills necessary for their interpretation.

Henry Dyer, the colleague I quoted at the opening of my remarks, says that the solution to this problem lies in the better training of teachers and counselors in the fundamentals of measurement. I am inclined to believe that it does - at least that the eventual solution does. What the users of tests need, says Dyer, is a strong dose of fundamental measurement theory well salted with the principles of statistical inference, experimental design, and the whole so eminently and obviously related to the business of teaching live pupils that no teacher can possibly miss the point. To this, I can say, "Amen". The sooner we start to include this kind of measurement training in the preparation of teachers and counselors, the sooner will education realize the full benefits that measurement has to offer.

But we have forty million youngsters in school now, being taught by teachers and counseled by counselors who have not come through this kind of training and are not likely to acquire much of it on the job. If we grant that the ultimate solution is better training of test users, we realize also that this better training will be accomplished only with a new generation of teachers and counselors. It takes time to change the course of education, and blessed few of these changes are retroactive.

In the meantime, the pressures of our times lead more and more of our teachers to use and misuse more tests. I have rejected so far in my remarks here the solutions attempted by most of us. That is, I feel that it is a tragic mistake to put a highly technical test interpretation device such as the IQ or the percentile rank or the grade equivalent into the hands of an untrained test user and expect him to limit his use of it by what he doesn't know about it. If we give him all of the details and limitations on the device we put into his hands, he is confused and almost certain to use them incorrectly. If we give him the device alone without qualifications, he usually trusts the device implicitly and carries its interpretation to ridiculous and dangerous lengths. The grade equivalent score, the percentile rank, and the IQ are examples of this approach.

To me, it seems that the profession must awaken to, and take action about, the need for a special device in test interpretation for the uses of teachers and counselors not specially trained in measurement. The idea is advanced here because I am sure that no single universal system can be developed and accepted for use by all consumers of tests. Our profession is so constituted that no single idea, however superior it might be to other similar ideas, can gain quick and clear dominance. We are independent enough as individual scientists to prefer many variations of even the most accepted notions in measurement. Thus, while the idea of creating a single system of special test interpretation for untrained test users and for gaining nation-wide acceptance of this system is an appealing one, it is not one that is realistic. To me, it seems that the creation of new test interpretation systems suitable for teachers and counselors is a responsibility that will be widely shared. It is people like those in this room who will create those systems of interpretation.

Allow me briefly to outline some characteristics which I think should appear in almost any test interpretation system that brings the best of measurement to bear on educational problems and yet avoids the dangers inherent in interpretation of test scores by untrained people. First, the system will make it apparent to teachers and others that the measurement process has many aspects and techniques, of which objective tests are only one. Second, the system will make it clear to teachers that the measurement process is an integral part of the instruction process, to be planned along with curriculum and learning exercises. (One of the most attractive and heavily-traveled and dangerous blind alleys in this business grows out of the notion that measurement is something that is conceived and applied after the instruction process has been planned and executed.)

Third, the system will provide test score interpretation appropriate for the uses which the teacher has the power to make. For example, if the teacher evaluates pupil performance in class on a five-point grade scale and differentiates her instruction into three or four groups in the class, there is infrequent need for any test score to do more than estimate which of four or five groups a given student falls into. Fourth, the system should have built into it an appropriate error of estimate.

Fifth, the system should provide for convenient recording and comparison of test performance. That is, test performance should be expressed in a way that lets the teacher record it in a place and in a manner that affords comparison between the student and his peers, between the several performances of a student at one time, and between the performances of a student at different times. During lunch, Miss McGill (not knowing in the slightest what I was going to talk about) suggested another way in which this recording should be done in addition to this fifth characteristic, which is that test performance should be recorded in a way that encourages the comparison with other non-test performances of the students so that test performance and class performance and playground performance and planned play performance pretty well fit into the same pattern of things and allow for a cumulative judgment about the progress of the pupil.

Point number six, the system should be one that not only permits but encourages the discussion of test performance by the teacher, by the counselor, by the pupil, and by the pupil's parents. The essential characteristic of such a system of test interpretation is that it has had taken out of it almost all of the precise statistics which specialists use. I am not recommending for a moment that the collection of these precise statistics is not necessary. A point test score, a percentile rank, an IQ, a grade equivalent - some or all of these fine indices will be necessary for the appropriate interpretation of the performance of groups by trained persons. These statistics are the raw materials with which we work to improve the instruments and the applications of measurement. I am saying only that these statistics are inappropriate for use by untrained persons and that a simpler and safer interpretation should be drawn from them for use by teachers and counselors.

The development of such a system isn't awfully difficult. As the director of testing in a city system of schools, for example, you could in one day devise an interpretation system that casts all test scores into quarters of the total distribution of performance and set up a scheme by which teachers interpret all student performances in terms of first, second, third, or fourth quarter of a distribution. This particular system appeals to me a great deal since it seems to me that it comes closest to fitting the capacity of teachers to do something about test results.

A finer discrimination among students than a simple division into quarters is for most teachers an unnecessary refinement. There are circumstances, of course, in which division of students into fifths, ninths, or even tenths of the total distribution will have advantages. With interpretation of test scores according to tenths of the distribution, however, I think that we may reach the upper limit of the precision of test score information that will be useful to teachers and counselors. Why would it be necessary, for example, for either a teacher or a counselor to know whether a student is at the middle or near the upper end of the seventh decile? The exception that comes to mind always is that of the exceptional child. It seems to me, though, that if someone needs to know whether a particular child is in the top one per cent of the population rather than just in the top ten per cent, this degree of discrimination in measurement of ability would better be left in the hands of a trained person and not at the mercy of the teacher's judgment.

As I have said, the devising of a system with the characteristics I have mentioned is not particularly difficult. The difficulty arises in persuading educators to use such a system. Teachers and counselors have become so accustomed to the interpretation of test scores in terms of decimal points and three-digit numbers that they suspect any other kind of interpretation as being less scientific. Let me cite an example from my own experience. The Cooperative Test Division of ETS has taken the plunge in the introduction of a new score interpretation system with its STEP series. If you are familiar with these tests, you know that the test scores can be interpreted only in terms of bands that occupy a considerable range along the percentile scale. Technically, this band score is equivalent to two times the standard error of measurement, and its center is upon the converted score of the student's actual test performance. The idea of describing the

reliability of the test score in terms of standard error of measurement is anything but new. The idea of describing the score as a band, though, has not had wide circulation before. This interpretation is one which we feel untrained test users can handle with less danger of over-interpretation than point scores, grade equivalents, or percentile ranks.

Introduction of such a system is one thing. It is somewhat difficult to describe for a readership accustomed to more precise interpretations, but not impossibly difficult. The acceptance of such a system by one and all is quite a different thing. In general, the trained test specialists have applauded us for the introduction of this system. Every one of them acknowledges that he could have made one better, and we do not doubt for a minute that he could. At any rate, we made the plunge with this particular one.

The idea gives some trouble to the partly trained and the completely unsophisticated users of tests who contemplate it for the first time. There is a very common suspicion, for example, that a test score that spreads over fifteen to twenty-five percentile points is somehow less reliable than a test score expressed neatly in a single number. We sometimes find it a little hard to answer a school principal who looks at this interpretation and then asks, "But what is this child's score?" The pressures generated by tradition in usage have forced us to include in a remote part of the manual the midpoints of the percentile rank band so that any user who must have a single score in numbers for each student can get it if he works hard enough. Other pressures are now building up to persuade us to bootleg the grade equivalent scores under the counter. While we resist this attrition of a concept we regard important in measurement, we also realize that in order to get the educators to use this new test interpretation, we first have to get them to use the test. At any rate, we do intend to stay with the concept of interpretation in terms of a confidence interval rather than interpretation in terms of the specific score.

I mentioned one of our own problems here in connection with some of our tests to illustrate a kind of job that faces the test specialist who introduces a new and better system of interpretation. Most of us recognize this as a job that is worth doing, and some of us see it as a job that must be done. I look forward to the time, perhaps twenty years from now, when most teachers will be a great deal more comfortable in their use of tests because the interpretations they draw from tests will be reasonable to them and far simpler than they are now.

I can hear a teacher talking to a student's parent along these lines: "John's classwork and test performances show that he is in the second quarter of the students in his grade in this school, but in the top quarter of students in the same grade, taking the country as a whole. Our estimates of his ability place him in the top quarter, too; so he appears to be getting along rather well. His test performance in social studies, though, is only in the third quarter. His grades in social studies are only in the second quarter. It looks as though we and John ought to give some special attention to social studies to see if we can bring his achievement there up to his level and our level of expectation.

"The fact that John is in the second quarter of students in this school and in the

top quarter among students nationally indicates that his competition is a little tougher here than it might be in some other school. We should look on John's achievement in terms of comparison with both his own school group and with students in other schools."

Gone will be the bugaboo of mystery and concealment of the measurement of ability. Gone will be the ludicrous attention to insignificant differences in test performance. Test interpretation, minus the mysterious paraphernalia of test specialists, can be comfortable and meaningful, hence used for the better understanding of teaching young people. I am not advocating taking the mystery or the scholarship or the science out of measurement. At the heart of educational and psychological testing lie concepts and techniques that never can be used by anyone but the specialist. I do not see a possibility of training all, or even most, teachers in the technical skills necessary for the kind of interpretation we now offer. Rather, I think we should do for teachers what the pharmacist does for a doctor's patient. He converts the technical scribbles on the prescription form into a neat little label that says, "This is for tummyache. Take a spoonful before each meal and at bedtime."

We have built many good tests (speaking of the brotherhood assembled in the room) and we have devised excellent, though technical, systems of score interpretation. Now let's allow the real users of tests to benefit by offering them interpretations they can use. Teachers will use tests if we let them.

THELMA E. DAWES (Director of Testing and Evaluation, Taft City Schools, Taft, California): Could you talk a little more about the system of interpretation planned along with curriculum?

MR. DOBBIN: That wasn't really a question. It called for further remarks. There is no more sincere flattery. I believe as most of us do, without making a special passion of it, that tests of achievement at least can be built best if they are built at the same time the curriculum is being built. Ideally, it would go something like this: A committee working on curriculum decides first what they would like a child to be able to do as the consequence of a certain unit of instruction. Then they set up what they will accept as evidence that the child has learned to do these things. Finally, they go on to devise the learning experience by which they expect the child to acquire these skills.

The second thing, the notation of the kinds of behavior that the planner will accept as evidence that the child has acquired the skill is, of course, laid out in the achievement tests. In the process of writing down the curriculum, if it is done in a certain way, there is provided a written outline of what needs to be measured in achievement testing.

GLENN C. MARTIN (Counselor, Santa Monica City College, Santa Monica, California): My questions are loaded. They might take off from the remark of Mr. Dobbin that teachers will use tests. Yes, provided that we provide them. In the first place, is not SCAT designed particularly for short-range predictions of school success depending upon the blended and consequently blurred measure of aptitude and achievement? The second question is that if you do not choose

to stay in the field of aptitude testing, will you grant permission for the reproduction of the ACE booklet?

MR. DOBBIN: The business about those being loaded questions was an understatement. I know you don't want an answer to the second one. That was rhetorical.

The first question deserves (and I hope it will get) a serious answer. The question was whether our organization (ETS) blurred, blended, and ignored the differences between aptitude and achievement in the development of the School and College Ability Tests. The answer is yes - partly because we had not been successful, and we were not too much impressed with the success of others, in distinguishing between aptitude and achievement. Secondly, it appeared not to make too much difference anyway, and because this combination of whatever it is that looks like aptitude and achievement is the best combination for prediction of future success. In the experimental work, it did work better than ACE in most cases. Our thought was, "What's the difference?" Our purpose is to predict academic success at the next higher level. We'll take whatever predicts it best, no matter what it is.

MARGARET J. SUITOR (Headmistress, Harbor Hill Coeducational Day School, San Francisco, California): What arguments can be used to persuade people who say that you could only find a verbal-type individual test to have any validity? They will not accept the validity of group tests. Is there anything that could be said very briefly that would persuade those people that there is validity in group testing?

MR. DOBBIN: I think you would get a much more scholarly answer if that were addressed to Dr. Gowan. Would you care to answer that one?

DR. GOWAN: Go ahead.

MR. DOBBIN: There is usually some validity in every serious criticism of tests. Tests are so far from perfect that a person really can't go to bat completely in defence of them against criticism. Our answers are always qualified.

Group tests have leaned heavily on verbal aptitudes and verbal skills because schools reward verbally-developed children more often than they reward children developed in any other way. When you measure the usefulness of a test by its prediction and you've got a verbally-loaded curriculum and verbally-oriented teachers, the most predictive test turns out to be a verbal one. It is not too surprising. This is a kind of practical answer, I think. This is an answer you get from a person who is wearing his test-builder's hat. The verbal skill, apparently, is the most predictive.

UNIDENTIFIED QUESTIONER FROM THE FLOOR: I am a little bit disturbed about what seems to be a fallacy and a certain amount of ambivalence here. For a long time, logicians have been worried about the definition of "intelligence" as "what intelligence tests measured". Our selection of gifted people seems to be so heavily loaded with standardized intelligence tests and achievement tests, and we seem to be so comfortable about this. Yet the first speaker

and yourself have indicted the schools as institutions that are shot through and through with conformity.

I am wondering if maybe we are committing a similar error with our achievement tests when we look for kids that have to be creative and productive, but we use a tool which may be undeniably linked with the past. Can you give me some more information about this blurring of aptitude and achievement tests?

MR. DOBBIN: I wish I could. My lack of ability to answer you precisely is related to my anticipation of the work Dr. Guilford described this morning. The other distinguished researchers with him and before him have worked hard on separation and identification of the various parts of whatever it is that we call intelligence. When this work reaches a point where its use will be not only predictive but definitive, then psychological and educational measurement will have moved a tremendous step forward.

I agree that we are doing a lot of groping. We are standing around on a lot of shaky assumptions. We are doing this standing, however (at least, I am, in connection with the answer on blurring between aptitude and achievement), simply because it's the best we've got for the job of predicting something that is awfully academic - academic learning. We do not predict nearly as well when we get away from school learning. We are predicting school success by whatever means we can find that predicts this success best. I know it isn't a very good answer. I hope I live long enough to see a good answer.

O. L. WIGGER (Assistant Head, Psychology Department, George Pepperdine College, Los Angeles, California): I am wondering about the prisoners in the high schools. What about these kids?

DR. GOWAN: I think the answer to this problem is that if we have people who are prisoners of the school system, it is obvious that what is going on in the school isn't meeting their needs. I am not sure just what their needs are and what meeting these needs would involve. I am wondering if our secondary schools really do meet the needs of some adolescent boys. I am wondering what can be done in this area. This is a real tough area.

I am not suggesting that this is entirely the fault of the high school. It is possible that we put too much strain on adolescent boys in our culture. I think that to solve this problem we need to decide what kind of things an adolescent boy is capable of doing. We know, for example, he is less mature than a girl. Yet, because of the sex stratification in our culture, we often put more responsibilities on boys at a time when they are not quite ready for them. Many of them have a sense of rebellion against authority.

I do think there is one thing, though, that research and measurement teach us. Generally, you have populations distributed in a continuous fashion. It seems somewhat unlikely to me that all the people who should leave school are clustered right at the 18-year age level. It seems there might be some who would profit by leaving a little earlier. It seems unusual that they should all be

there, and none below this level. This is a little different from what we usually think about it.

CHAIRMAN MICHAEL: I am sure that we are all most appreciative of the fine contributions that our five speakers have made today. We certainly have been exposed to a wide range of topics underlying the use of tests for the discovery and development of human talent, and we have been presented a number of different points of view. We have been attempting to relate testing practices to the entire school situation - educational policies and philosophy, the curriculum, and guidance activities. The identification of gifted boys and girls who are in a position to contribute to the advancement of our culture by their creativity and leadership, and the subsequent development of their talents to an optimal degree, constitute a challenge we must not minimize.

We want to thank the Educational Testing Service once again. It is only through our ability to communicate and to keep ourselves up-to-date that we shall be able to take what we know about measurement to the school and the classroom situation, apply our knowledge meaningfully, and really come out with some positive contribution.

On behalf of the Educational Testing Service, and as your General Chairman today, I want to thank all of you for the interest you have shown. I hope that many of you will be able to return next year for the Eighth Annual Conference. I am sure it will be as interesting as today's effort. Perhaps by that time, measurement will have edged just a little bit farther forward, and we shall be able to do a little more with it. Again, many thanks; and good luck to you for the coming year.

(The meeting was adjourned at 3:30 p. m.)

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